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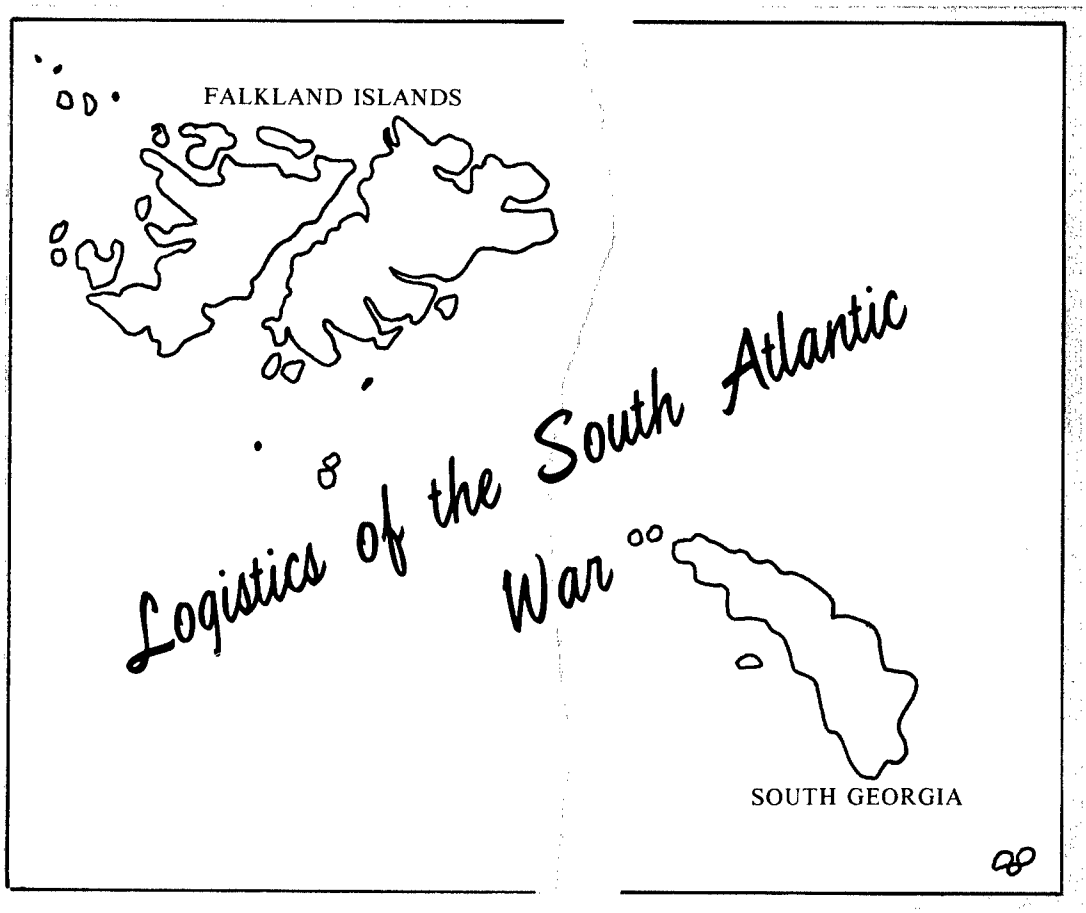

Logistics of the South Atlantic War

Presenting The 1979-84 Cumulative Index

AIR FORCE JOURNAL of LOGISTICS

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Purpose The *Air Force Journal of Logistics* is a non-directive quarterly periodical published in accordance with AFR 5-1 to provide an open forum for presentation of research, ideas, issues, and information of concern to professional Air Force logisticians and other interested personnel. Views expressed in the articles are those of the author and do not necessarily represent the established policy of the Department of Defense, the Department of the Air Force, the Air Force Logistics Management Center, or the organization where the author works.

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Combat Logistics: The South Atlantic

Group Captain R. N. Whittaker, MBE, RAF
Staff Officer to Director General of Supply, Ministry of Defence
Whitehall, London, United Kingdom

I was fortunate enough some time ago to be asked to accompany our Director General of Supply to Headquarters Air Force Logistics Command (AFLC), Wright-Patterson AFB, Dayton, Ohio, and participate in a presentation to the Vice Commander and some of his staff on our Supply and Movements activity in the South Atlantic. Your Editor, ever hungry for new copy, subsequently asked if we could write an article on the same theme. Since the Argentinian invasion on 2 April 1982, so many millions of words have been written about the campaign that it seems impossible to find anything original. I hope, however, these few thoughts by a Supply Officer about what we had to do in order to support our air forces may find an echo in your thinking and concerns.

Our organisation is naturally smaller and somewhat different from the USAF. The Director General of Supply for the Royal Air Force (RAF) heads his staff within the Ministry of Defence in London. Not only is he advisor to the Operations Staff for Supply matters, with the policy responsibility which that implies, but he also has direct staff responsibility for determining and requisitioning supply requirements. He is responsible for the integrated automatic data processing (ADP) system we use to control and manage our stocks. As you would expect, he has a staff branch dedicated to planning operational supply support which provides personnel to work in the Air Force Operations room, once it is activated during any crisis, with a back-up organisation to concentrate his policy and executive responsibilities.

In the United Kingdom (UK), each of the Services has a main operational headquarters. The RAF's Headquarters Strike Command is at High Wycombe with a small Supply staff responsible to the Commander-in-Chief for the operational support of his forces. We also have Headquarters RAF Support Command which, as its name implies, is responsible for the training of personnel as well as the receipt, depot storage, in-service repair, and issue of equipment. Whilst we do have a fairly comprehensive range of in-service repair capability, my impression is that we rely much more heavily upon industrial repair than does the United States Air Force (USAF).

Responsibility for certain ranges of equipment has been rationalised to one or other of the Services. That is to say that one Service has become responsible for aggregating the forecast requirements of the other, budgeting, requisitioning, storing, repairing, and issuing to users all the items in a range. For example, the Army are responsible for mechanical transport, combat clothing, and tentage whilst, amongst other things, the Royal Navy (RN) look after ships' stores and rations. Not, unnaturally, the RAF is responsible for most aviation fuel, all air stores (i.e., spare aircraft parts and support equipment), as well as domestic furniture and furnishings.

We have a computer-based supply control, provisioning, and accounting system: the RAF Supply ADP system. The system links our stations, depots, and staffs on line, and in real time, so range managers can see the status of a line item within seconds, at any time of the day or night, from contract dues-in right down through depot and station stocks to the nonconsumable items held forward in the stations' flights and sections. During the Falklands campaign this proved a valuable tool, particularly when we were able to take some of its functions forward to Ascension Island during the war and ultimately to the Falkland Islands themselves shortly afterwards.

We base our operational Supply support on stations holding an agreed level of stock to support a predetermined level of flying activity, and we push equipment forward to stations on the basis of scales or past consumption. For those units with a planned mobile role, we provide Fly-Away Packs (FAPs) which again comprise spares and equipment to support a predetermined level of activity and a planned level of repair capability.

That then was our posture when the Falklands campaign began. We had for many years been withdrawing from the territories and commitments of empire and concentrating our military capability in support of NATO, with largely the defence of Europe in mind. Suddenly, we were faced with a political requirement to recapture a collection of bleak islands, about the size of Connecticut, lying 480 miles east of Cape Horn, at the southern tip of South America, and some 8,000 miles from our homeland. The airfield and fuel reserves at Stanley, as well as our limited air-to-air refueling (AAR) Air Transport capability, had been inadequate to sustain a strategic pre-emptive reinforcement, so the operation was initially seen to be an amphibious one with a passage time of at least 20 days. As the campaign developed, however, we saw the mounting of air operations down a route 4,000 miles via Gibraltar, to a little volcanic outcrop at Ascension Island, and finally supporting the task group over a further 4,000 miles and attacking the Falklands. To put that last sector alone into an American perspective, it was like trying to recapture Hawaii from an advance base in Dayton, Ohio, except that it was sea all the way.

Those long overseas distances both complicated and magnified Air Force operations. By 18 April, we had Victor tankers operating in the photo and radar reconnaissance role ahead of the advancing task force and extending their range by mutual AAR. Perhaps the most imaginative operation was the attack by Vulcans on the Stanley airport which opened the battle for the Falklands proper. It required the launching of practically every available Victor tanker and innumerable successful air-to-air fuel transfers, both tanker-to-tanker and then to bomber, in order to provide sufficient fuel for the two bombers to make their long run into the Falklands. Behind them, Victors were being recovered to Ascension Island, filled, turned around, and launched again in a carefully timed sequence, once more to extend a literal lifeline to meet and recover the returning bombers.

Such is the leap-frogging pressure of operations that we had little time to ponder the longest operational bombing raid in history. Such feats soon became almost commonplace as the

Vulcans returned to attack radars with anti-radiation missiles (for which they were specially modified), and Nimrod maritime aircraft, as well as transport aircraft, were flight refuelled across the thousands of miles of hungry seas. During the campaign itself, the 16 Victors committed flew over 630 AAR sorties. There was a frenetic rush to modify and equip a variety of aircraft with flight refuelling probes. Vulcans and Hercules (C130) were hastily converted to tankers to increase our capability so that on 1 and 2 June we were able to fly a flight of four reinforcing Harriers from the UK to the deck of HMS HERMES with only one en-route landing at Ascension Island. During most of the time on that last nine-hour sector to the ship, the aircraft had no land diversion and none of the pilots had ever landed on a carrier previously. Other RAF Harriers went with the fleet; some cocooned on the decks of hastily converted merchant ships and were soon in close support of the ground forces.

"Everyone's work level went up and a great premium was placed on the multi-skilled man."

This short recital of some of our activity clearly illustrates the importance of Ascension Island as a base. The island is British but the airfield and an enclave have been leased to the United States for use in their space programme. The USAF employed contractors to run the airfield and had virtually no military presence. This rather complicated relationship was to have little effect, but the airfield itself imposed a number of operational and logistic constraints. The available aircraft parking area was too small to accommodate all the aircraft which the variety of operations demanded, so some aircraft and units had to be moved to the island for the period of their particular operation and then withdrawn to make space for higher priority tasks. Similarly, the fresh water supply limited the joint-Service presence on the island to about 1,000 servicemen. Priority was clearly given to operational personnel, and this severely limited the logistic staff that could be deployed. Everyone's work level went up and a great premium was placed on the multi-skilled man.

The air and ground defence of such an important link in the chain became a keen operational consideration. Successively, Harriers and Phantoms (F4s) were deployed in the air defence (AD) role with a mobile AD radar and contingents of the RAF Regiment. The Harriers were flown down to undertake the AD role until they were put onto the deck of the container ship Atlantic Conveyor for the journey to the Falklands. A detachment of Phantoms was finally sent to relieve the Harriers. I only mention these deployments to illustrate some of the logistic tasks like positioning Harrier weapons and FAPs at Ascension and leaving ship space ex (from) the UK for them to be helicoptered aboard en route. Before the Phantoms were selected for the job, we had assembled from stock an FAP for some Lightnings, which normally do not have a deployment role, and had prepared the aircraft in a long-forgotten, overwing, long-range ferry tank role. Involvement in such hot planning situations confirmed for me some old but important lessons: the value of sensible contingency planning which prepared building blocks of capability that can be assembled as a solution to different problems; the importance of the supply staff officer staying close to his air operations staff's thinking in order to save time and nugatory effort; and the need for enough logistic resilience to accomplish not only the final operational plot but also the inevitable preparations that, for good operational reasons, have to be aborted.

It was both politically and militarily important that the task force should sail from the UK as quickly after the invasion of the Falkland Islands as possible. The demand for sea freight clearly exceeded the capability of our Royal Fleet Auxiliaries. Historically, our legislation includes enactments which allow the Crown, in certain given circumstances, to requisition ships. The Queen's Order in Council, which authorises the Government of the day to do this, was signed early in the Falklands conflict. Requisitions in this way allow the ship owners to plead "force majeure" and so avoid third-party claims.

The Royal Navy maintain records of British flagships suitable for such conversion and use. Once the operational headquarters had outlined their requirements, the Ministry of Defence (MOD), in conjunction with our Department of Transport, chartered or requisitioned the vessels required. These were known as ships taken up from trade or STUFT—an acronym which spawned many ribald comments. MOD in fact took up 54 ships from 33 companies ranging from trawlers, to be used as minesweepers, through to the Queen Elizabeth II and the ill-fated Atlantic Conveyor as passenger and cargo transports. The ships were quickly equipped for refuelling at sea and many were modified to take helicopters and Harrier vertical and/or short takeoff and landing (VSTOL) aircraft. Although complicated, it was achieved quickly and the liner Canberra, for example, was at sea with 2,500 troops and a steel helicopter flight deck in less than 60 hours after the last of 1,500 fare paying passengers was disembarked. A second helicopter deck was fitted on passage to Ascension.

We in the RAF found that our long dependence on airlift and rollon/rolloff (RO/RO) ferries had led to a decay in the skills of preparing cargo for break bulk shipping. We certainly had to expand our representation at ports to marshal RAF cargo, to watch for and avoid damage, and to secure loading and storage details.

Given the speed with which the task force was assembled and dispatched, some of the stores had to be relocated en route. Items not available in time for sailing were flown down to Ascension and put aboard by helicopter. Much of the adjustment of loads took place whilst the task force was in the vicinity of Ascension. The island has no port and the ocean swell makes lighterage a hazardous business on all but the calmest of days. The RAF positioned Sea Kings and Chinooks at Ascension to work alongside the RN Wessex and, as the task force sailed past, they moved some 2,500 tons of cargo and passengers to and between ships.

"We lived on a knife edge in those early days trying to keep our capability just ahead of the operator's requirements."

An army may march on its stomach, but a modern air force is totally dependent upon its fuel supplies. With all the air activity centered on Ascension Island, the supply and handling of aviation fuel became a critical logistic problem. We had maintained a small contingency reserve of fuel on Ascension to support mercy and evacuation plans, but this was a derisory amount in terms of the operations being projected, and we envisaged aviation fuel becoming a major operational

constraint. A tanker already at sea and bound elsewhere was diverted into Ascension, and by 8 April she was hove-to off the island.

Having the fuel alongside was only the beginning of a solution. Fuel capacities on the island were not designed for the daily off-take of 250,000 imperial gallons which was being projected. There was reception tankage at St Catherine's Point on the shoreline, and fuel was bridged by road tanker up the sometimes steep 3½ miles to fill this limited airfield tankage—a 45-minute round trip. The installation at St Catherine's Point had common reception and discharge piping so that, when fuel was being received, no issues could be made to the airfield, and by this time the airfield tankage could not support our daily off-take. Initially, we flew out additional road tankers and a series of rubber bladders to extend the airfield capacity. It was not long, however, before the constant heavy refueller traffic started to break up the island's roads. At this point, the Army installed a linking pipeline with booster pumps along the way to bring this fuel uphill; and, as soon as it was completed, it was working at least 12 hours in every day just to match the off-take.

We lived on a knife edge in those early days trying to keep our capability just ahead of the operator's requirements. There were many nervous moments as we calculated projected off-takes against projected reserves, particularly in the run up to a major flight refuelled operation. Even later when we had built up reserves and capability, we were to be taught another sharp lesson about the quality of fuel. With all flights from Ascension entailing long water crossing, the quality assurance of the fuel was a prime consideration. One bulk receipt was put into a number of reception tanks and then, on further routine checking, was considered to be off-spec. With our usable reserves dwindling and much of the tankage in *baulk*, our calculators were once again busy and there was much movement of samples and experts before the problem was resolved and we had, once more, guaranteed fuel supplies.

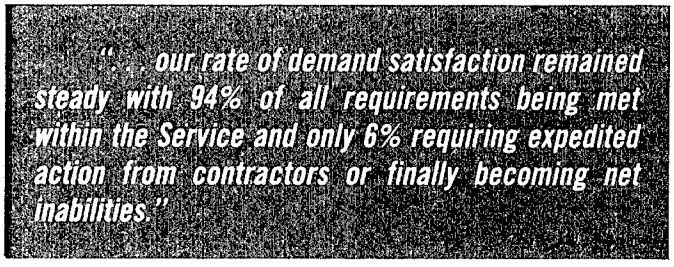
At Ascension on merchant ships and later on the Falklands, the RAF used its Tactical Supply Wing (TSW) to operate fuel installations. TSW had been conceived some years earlier as a mobile unit capable of establishing a supply organisation on a bare-base airfield, and at a number of associated flying sites, in an overseas theater. By April 1983, however, as a result of our concentration in the NATO theater, it had become largely an aviation fuel handling organisation, its forte being the rotors-turning refuelling of helicopters in the field. A TSW detachment sailed on the first ship of the task force with sufficient portable pumps, pipes, and rubber tanks to create a small forward airfield installation. Latterly, other detachments were to join merchant ships and refuel the aircraft embarked. We attempted to achieve this with the help of rubber tanks stowed and filled. Unfortunately, despite strong lashings, the tanks moved and ruptured in the heavy seas and caused some consternation as free fuel slopped about the ship. Metal replacements were flown to Ascension and installed whilst the ships were on passage.

In conjunction with the Army, who operated the pipeline, TSW managed the airfield fuel activity on Ascension Island throughout the campaign. They discovered old skills to become the embryo base supply organisation, coordinating the supply activities of the deployed squadrons who had their FAP-based, first-level support. Finally, it was TSW that was despatched to create supply support at the newly liberated Stanley Airport. The availability of a specialist Supply unit in the shape of TSW, which was able to form detachments of men appropriate to the task from personnel skilled and trained for field conditions, considerably enhanced our speed of reaction and effectiveness. The same was true of the other specialist units such as those for field communications and mobile air movements. In the specialisations where such units did not exist, the problem of forming teams by drafting individual personnel from one of a number of stations to cover a task was appreciably more difficult and less effective.

As I mentioned earlier, our Squadrons that have a mobile or deployment role in NATO are scaled with FAPs of spares and equipment. We aim to keep these packs at almost 100% completeness at all times. Most of the ground equipment is drawn from station resources once the alert is given, as indeed are some of the spares. The FAP can be deployed, however, in preselected and prepared containers in a very short time scale.

Unfortunately, the numbers of aircraft and rates of effort to be supported in the Falklands were different from those for which most of the packs had been designed, and there was the added problem of filling a sea resupply pipeline of well over 21 days' sailing time. Some of the aircraft being used had no NATO deployment role and, for these, FAPs and battle damage repair kits had to be assembled from scratch. These adjustments took considerable joint Engineering and Supply effort. Inevitably, there were heartbreaking changes as the air operations staff's plans were revised and altered to meet changed circumstances. It was certainly where we felt the benefit of our ADP support. Demands typed on the stations' visual display units (VDU) showed instantly where stock was held, and an instruction to issue could be printed at that location for action within seconds of solutions being accepted.

Our depots and major flying stations in the UK are normally linked by a cascade road transport network giving a twice daily service. By judicious backloading through depots, we can move priority consignments around the country in a matter of hours rather than days. As the campaign got underway, this Priority Freight Distribution Service (PFDS) was boosted to take the increased loads and, before long, the preparations were complete and discrete convoys of vehicles were taking detachments to the ports.



This was a period of high activity not only for those units being embarked but also for the stations where training and development were taking place. The changed demands of the South Atlantic required aircraft to be modified with different weapons and fits. These modifications, and changes in tactics, required an intensive period of flying and weapon training before forces were effective in their new roles. Our rationalised responsibility for air stores meant that the RAF supply system was also meeting the Royal Navy's requirement for these items both ashore and afloat. During the campaign, our ship storing depot outfitted completely some eight RN ships, including an aircraft carrier, with 45,000 line items and met heightened demand rates from the rest of the fleet, not to mention the many domestic items required for the STUFT. In this four months from April 1982, the total demand activity in

the supply system doubled and, as you might expect, much of the activity was with the highest of priorities. What was most encouraging was the fact that our rate of demand satisfaction remained steady with 94% of all requirements being met within the Service and only 6% requiring expedited action from contractors or finally becoming net inabilities.

We must acknowledge the value to an air force of close industrial support. I have mentioned on a number of occasions modification of aircraft to cope with the unique demands of the South Atlantic campaign. Some of these were accelerations of planned enhancement programmes—such as the fitment of Sidewinder to our Harriers—but many others were short-term reactions, like obtaining and fitting of Omega and Twin Carousel inertial navigation equipment to tanker and to some receiver aircraft for the pinpoint navigation which AAR operations over the long sea distances required, or like the fitting of AAR probes to the Nimrod. By peacetime standards some of these modifications were completed in incredible time scales. Only eight days after the first test firing, we had nine fully missile capable Harrier GR 3s en route to Ascension. The Harrier GR 3, normally a land-based aircraft, was modified for carrier operations, and there was a lot more to that than just drilling holes on the underside to let the seawater run out! Within 4 days of a statement of requirement, one company had designed, test fired, and produced mod kits to put rocket pods on a series of helicopters; in 21 days from scratch, we had a long-range flight refuelled Hercules capable of flights of 28 hours' duration in order to drop vital spares, and mail, to the Task Force off Falkland Islands. It was not all aircraft equipment. We took night vision equipment from a development programme, and such was the demand for these improved sensors that one staff officer at the Headquarters spent virtually all his time tracking their location and reallocating resources to meet the air operations staff's changing priorities.

Behind the glamorous achievements of industry there were, of course, thousands of other deliveries to support newly introduced equipment or to sustain the increased activity. Our Ministry of Defence Supply Management staffs and the Priority Progression staffs within the Commands showed their value, and there were quite a few Managing or Production Directors of companies that got a telephone call at night or even on the weekend with a request for equipment. The response was invariably heartening from management and work force, and even ongoing industrial disputes were set aside briefly to provide some of our needs. Deliveries or collections were often arranged before the contract. Nor was this support confined to British industry; it is interesting to recall in this age of collaborative projects and multi-national companies quite how widespread and outstanding was that support at all levels.

The RAF method of supporting deployed forces was quite straightforward. Squadrons deployed with their FAPs. Requirements not in the pack, or replenishment demands for the pack, were signalled back to parent stations who became responsible for obtaining the item, even by robbing if essential, bay checking it, and despatching it through the system. To save time, we used the mounting airhead as the support unit for nontechnical ranges. Early in the campaign, we enlisted the aid of our Jetstream aircraft, used for flying training, to fly stagecoach around our UK stations. It was more interesting navigation training, and it moved high priority consignments to the airhead. We soon found that we were getting items to Ascension even from the north of Scotland within 18 hours of demand and, at a later stage in the operation, really vital items were being airdropped on the Falklands, 8,000 miles away, within 40 hours of the request.

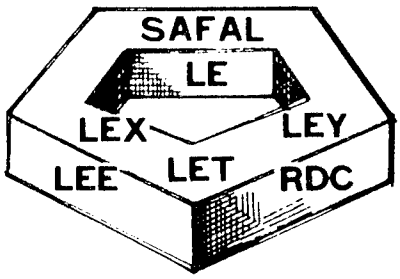
We allowed stations and depots to send items under 6′ x 4′ x 4′ and less than 1,000 pounds weight direct to this airhead. Spares urgently required to service aircraft were sent this way, but their movement was reported and accorded special handling. Larger items were subject to controlled call-forward. Our VC10 and Hercules (C130) mounted a steady stream of flights to Ascension. In the 10 weeks of the campaign, they logged nearly 20,000 hours in 600 sorties to move 5,500 passengers and 700 tons of cargo.

As I have said, the main aim of Ascension in movement terms was to stock and replenish the task force. Cargo was received in bulk on an otherwise barren hard-standing and broken out by a small party of Royal Marines into marked areas for helicoptering to the passing ships or for movement to the units on the island. Aircraft movement peaked around 400 a day which must briefly have projected Wideawake into the top end of the busy airport league. With that kind of transhipment activity and with a limit on the number of control people we could deploy, we had our movement problems. In their enthusiasm to get a job done, some people did not seem to notice that packages were not addressed to them, and also we had to reintroduce even more distinctive consignment marking for spares required to service aircraft. Relatively, the misconsignments were very, very few but, by the Devil's law, mostly they seemed to occur with those particularly vital bits that somebody decided to help by short-circuiting the system.

The enthusiasm that existed during the campaign has naturally largely evaporated, but I am pleased to see that the many lessons learned at all levels during those hectic weeks are being staffed to improve our general capability. It brought home to me the real meaning of the flexibility of air power and the great speed with which intention can be changed as long as a balanced capability is retained. I was heartened by the support we were given by organisations and individuals throughout our society, and I was encouraged to see that basically we had a very sound logistic system. Our logistics low point was undoubtedly the loss of the Atlantic Conveyor; we had, for a variety of good reasons at the time, a lot of kits in one place, but lost them in battle. There were a few hectic hours which showed the value of careful logistic documentation even in war and highlighted the operational need to be able to assess rapidly the effect of such losses not only in theater but also, through their replenishment, on all other residual commitments. In the end our efforts supported successful operations, but I believe the true value is what our people learnt and the confidence they gained in their logistic capability.

"Rations for men and NCO's [French Army - 1804] were fixed at 1.5 lbs bread, .5 lb meat, one ounce rice, and 2 ounces dried fruit per day."

Martin Van Creveld in
Supplying War



USAF LOGISTICS POLICY INSIGHT

New COMPES Procedures

With the summer 1984 release of new software to support the Contingency Operation/Mobility Planning and Execution System (COMPES), logistics planners now have the capability to identify the thousands of tons of prepositioned equipment which supports USAF combat operations but does not require strategic lift. Previously, this tonnage was included in a unit's movement requirements because the automatic data processing (ADP) systems and planning procedures were not available to accomplish this detailed planning. The new COMPES procedures should save hundreds of MAC C-141 sorties which support major USAF deployments.

Free Flow Concept

In an effort to reduce documentation and move cargo faster, a free flow concept of operation was implemented within the Logistics Airlift (LOGAIR) system. This concept allows approximately 50% of LOGAIR shipments to flow through the system without being manifested or having in-transit data cards prepared. The following shipments are exempt from free flow operations: Mission Incapable (MICAP)/999, Special Handling (Signature Service or Hazardous Materials), cargo destined to or from oversea activities, and specific project coded items.

Since implementation of the free flow concept in early 1982, cargo has moved more rapidly through the LOGAIR system without any adverse effect on lost or misdirected shipments. Cargo movement times continue to improve each year. In 1983, shipment transit times were reduced by 28% for MICAP; 30% for Transportation Priority 1 (TP-1); and 13% for Transportation Priority 2 (TP-2). We are now moving MICAP and TP-1 shipments within 2 days; prior to free flow these shipments were requiring 2½ to 3½ days.

These favorable results have allowed our weapons systems downtime to be reduced, thus improving the readiness posture of the Air Force and Department of Defense. Our objective is to increase the overall number of shipments and materials moving under the free flow concept.

Intermodal Container Airlift Support System

This fall the Air Force will mark the introduction of the first intermodal air containers and container handling equipment (CHE) into the Military Airlift Command (MAC) airlift system. MAC is purchasing 50 commercial air/land containers to support all users' requirements for air container service. The CHE to support this requirement for both peacetime and wartime has been programmed through FY88. Over this period, MAC will purchase 34 pieces of commercial off-the-shelf CHE to support the strategic aerial ports and 16 pieces of air mobile CHE to support the mobile aerial port worldwide commitment. In addition, research and development will begin on a system to adapt the International Organization for Standardization (ISO) containers to the MAC aircraft and materials handling equipment 463L system. The total intermodal container airlift support system should be in place by FY89.

Automated Fuel and Oil Dispensing Systems

The 63 automated fuel and oil dispensing systems installed at various continental United States (CONUS) bases have exceeded expectations. Accounting accuracy has increased, paperwork has been significantly reduced, and overall customer service has improved. Air Force plans to procure and

install 54 additional systems in FY86/87 and will expand the program to include bases in the European and Pacific theaters.

Exemption in Movement of Hazardous Materials

The Department of Transportation (DOT) has issued an exemption (DOT-E 9232) to allow movement of hazardous materials to include class a and b explosives aboard civil aircraft in the Civil Reserve Air Fleet during a declared national emergency or contingency operation. This exemption will allow movement of hazardous materials aboard civil aircraft consistent with the military requirements contained in joint service regulation AFR 71-4, *Preparation of Hazardous Materials for Military Air Shipment*.

Fuels Mobility Support Equipment Packages

The Air Force maintains packages of air transportable fuels storage and dispensing equipment for use in bare/austere base environments or to augment in-place main base systems. These equipment packages fall under the auspices of AFR 400-24, *War Reserve Materiel (WRM) Policy*, "Bare Base Systems," and are commonly referred to as Fuels Mobility Support Equipment (FMSE) packages. The Air Force plans to expand the capabilities of the FMSE packages by adding air transportable cryogenics generation/production plants and flow-driven, fuel-additive injection pumps to the inventory. Procurement actions are planned for the FY85-87 time frame, and when completed, will ensure an improved support capability for bare base operations.

Item of Interest

Military Planning in the Twentieth Century

The Executive Director announced the convening of the Eleventh Military History Symposium at the United States Air Force Academy, 10-12 October 1984.

The Symposium "will provide a forum to examine successful and unsuccessful examples of planning. . . . The meeting is dedicated to . . . forthright scrutiny and to developing a source of historical insight and professional military commentary valuable to today's historians and military planners." For further information, please contact: Executive Director, Eleventh Military History Symposium, Department of History, USAF Academy, Colorado Springs, CO 80840.

Item of Interest

Jerome G. Peppers, Jr., Associate Dean of the School of Systems and Logistics, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, has recently announced his retirement. "Jerry" has served on the Journal's Editorial Advisory Board since its inception in 1979 and has been a big brother to each of us. He has campaigned ceaselessly to make our logistics corps more "generalized." Fortunately, General Marquez is also aware of our lack of generalization and has given the Journal the opportunity to participate in a project to find ways to "de-specialize the corps." Jerry, we are sure, will closely watch our progress.

Peppers enlisted in September 1939, served the Army Air Corps until 1946, and was recalled to active duty in 1951. In 1964 he officially retired to accept employment with the Ohio State University. In 1966 he joined the faculty of the School of Systems and Logistics and, over the years, rose to its highest positions, serving as Associate and Acting Dean at different times.

During his 18 years at AFIT, Jerry earned the outstanding professor designation, the Gage Crocker Award in 1978, Outstanding Educators of America in 1977, and was named to Who's Who in International Education in 1979.

The Journal has asked Jerry to continue to serve as a retired member of our Editorial Advisory Board.

▶ FROM 17

key people in your career field and, when opportunity presents itself, seek their advice. The experienced career officers should be happy to talk to you about your career. Remember, HQ AFMPC will strive to help you build your career and provide a source of information on Air Force-wide requirements. There are differences in desired career progression steps for various career fields; some emphasize extensive career broadening while others require greater specialization. You should be familiar with the general career development information in AFR 36-23, *Officer Career Development*, which pertains to your particular career field.

(3) Understand the officer promotion system and take appropriate actions *before* the board convenes. One of those actions is to review your records for accuracy and currency. If you comprehend the selection process and the documents the board will be evaluating, then you can enhance the likelihood of your selection. An important tool in understanding the Air Force promotion system is Air Force Pamphlet 36-32, *You and Your Promotions - The Air Force Officer Promotion System*, and the governing directive, AFR 36-89, *Promotion of Active Duty Line Officers*.

Source: Lt Col E. C. Humphreys III, HQ AFMPC/MPCROS1, AUTOVON 487-3556

Spares, Prices, and Performance*

Lieutenant General Leo Marquez , USAF
Deputy Chief of Staff, Logistics and Engineering
HQ USAF, Washington, D.C. 20330

*Adapted from remarks made by Gen Marquez to the Spare Parts Committees, Aerospace Industries Association/Electronic Industries Association, 15 May 84.

The dictionary defines a keynote address as a speech that presents important issues, principles, and policies that should set the stage for the program to follow. If you think about it—that is a tall order. Before I talk on the specifics of spare parts acquisition, I would like to spend a few moments putting this subject in a broader context.

Beginning in 1981, when President Reagan initiated the rebuilding of our national strength, there was a perceived need for action, and we enjoyed both public and congressional support.

But such rebuilding is not cheap. The defense budget for FY85 comes to $305 billion. The Air Force share, including for the first time almost $5 billion for retirement accrual, is $108 billion. We are concentrating on strategic modernization, readiness and sustainability, increased airlift capability, and modernizing and expanding our tactical forces. But all of these programs are at risk. The American people are concerned about huge budget deficits. Many taxpayers blame the defense budget and the rising costs of major weapon systems for these deficits. The plethora of "horror stories," regarding spare parts, and instances of fraud, waste, and abuse have further fueled the fires of criticism.

There are clear signs today that our support is eroding. Due to the state of our economy, our country and its citizens face painful tradeoffs. Particularly alarming are the polls that indicate more and more people today believe the likelihood of war is increasing, not waning.

The important national question is: How should we respond? Our resounding answer continues to be that we can only deter our adversaries through a position of strength. Military strength, we hope we will never use but, nevertheless, we must develop and be prepared to use that strength. This has been the administration's philosophy ever since it entered office in 1981. Besides, only through strength can we expect the Soviets to negotiate seriously for arms control agreements.

In rebuilding our security posture, President Reagan's objectives were not shortsighted but, instead, were a carefully constructed multiyear plan for this country to recapture its strategic position in the world. We have come a long way since 1981 in correcting many of the serious deficiencies that piled up in the 1970s.

"Much of this improvement is due to the vitality that we restored to spares funding."

The sobering recognition of the essentiality of logistics led directly to a doubling of funding for readiness and sustainability over the past three years. The result is a clear sign that combat readiness is increasing. For example, we are now able to support a more viable training program. Peacetime flying hours are up from 13 hours per aircrew per month in FY78 to about 17 hours in FY82, and now average about 20 per month. Concurrently, our training and combat exercises are more aggressive and realistic. Despite increased flying and realistic training, we experienced fewer accidents in 1983 than any other year in the history of the Air Force. These kinds of improvements have enabled us to operationally surge to 60% more tactical sorties than we could just three years ago. And, more importantly, we can also maintain our surge rate for twice as long as we could then. As we examine our airlift forces, we find that we have been able to double the surge capability of the C-5 between 1980 and today. And in the same time frame, we increased the C-141 surge capability by about 30%. Much of this improvement is due to the vitality that we restored to spares funding. As a result, mission capable rates for many aircraft are up. More importantly, we are consistently improving our battlefield staying power.

Thus, the bottom line to the President's program is, if we stay on track, we will be able to sustain our forces in the major theaters of Europe and the Pacific, while we deploy our rapid deployment forces to respond to other potential conflict regions during the early stages of a major global conflict.

But, besides trying to correct the deficiencies we inherited from the late 1970s, we must continuously strive to maintain the requisite air power characteristics needed for tomorrow. This is a central point in 1984 regarding the argument about how much defense is enough. The environment is not static, and it is for this very reason that we must continue to make important investments in air power.

". . . we can recognize and then, more significantly, make the commitment to the necessary logistics aspects of air power."

This is also the central point as to why the potential contribution of your two groups is so critical. We currently face many challenges and, at the same time, opportunities. And, in most cases, the challenges are not those of the past in designing airplanes that can fly faster or sustain a tighter turn. I am extremely confident that we have the ability to do that for the future. Instead, my concern is whether we can recognize and then, more significantly, make the commitment to the necessary logistics aspects of air power. History has often demonstrated the principles of war. Today, the lessons for the essentiality of the logistics principle are confronting us more and more. This is the same emphasis this committee is dedicated to improve. We must jointly commit ourselves to an agenda that provides those capabilities for the future.

I believe there is a mosaic of *four* critical components of our future architecture. In each and every one of these, *we need to*

improve the art and science of logistics technology, education, and management. The magnitude of the task is awesome, for it inherently touches every aspect of the Air Force.

The cornerstone of that mosaic is our *people*. For decades, we have managed our people without regard to an end objective. That objective should have been to develop a large cadre of logistics officers—officers that are able to manage the total logistics system comprised of its many subsystems. Instead, what we have done is to "stovepipe" our officers in functions, such as maintenance, supply, or transportation. We failed to recognize that our real product, that of combat sorties, results from the combination and interaction of all these functions. To perform these functions effectively, we must have people who are able to operate and manage a total system. Instead, we have been developing senior officers who, in many cases, have come up through the ranks in only one specialty. Not recognizing that we needed managers instead of maintenance officers or supply officers, these people have reached senior positions unprepared to manage the totality of our complex logistics system. For a start, *we have initiated in my office a program to examine the feasibility of achieving this objective*. As I am sure you can envision, this change will have long-range implications for the logistics force, and it is not something that we can just haphazardly adjust. We need a complete, overall plan and balanced program.

"The air power of tomorrow must be mobile, lightly manned, and be dependent only on the availability of surfaces and a supply of water, fuel, and munitions."

In addition, complexity is very striking as we look at the evolving weapon systems that we are required to support. Our *logistics approach to weapon system design* is our second piece of the mosaic. What we must do is reeducate people to the false notion that we should design aircraft for performance and then, if there is time or money, later worry about supportability features. That management objective resides in the minds of many—both within and outside the force. However, that principle will no longer sell airplanes. The logistician must also be recognized as a customer—not for himself as another advocate, but as a surrogate for the supportability features that are really operational requirements. The primary goal is operational effectiveness, with reduced life cycle costs as a coequal target. That means that the air power of the future must be able to operate independently of fixed maintenance infrastructures, fixed communications networks, air terminals, and computer networks. The air power of tomorrow must be mobile, lightly manned, and be dependent only on the availability of surfaces and a supply of water, fuel, and munitions. These are not necessarily new ideas, but a vision we lost along the way in the name of savings.

But that vision must be coupled with design tools—and this is where we invariably fall short. This is again another area with which you can help. In comparing the operator and logistician, the logistician still does not have the array of tools necessary to quantify supportability requirements to industry. In contrast, the operator has an impressive array of quantitative methods to communicate with a design engineer as to how fast or how many "Gs" that aircraft must be designed for in order to counter the threat. Even in this day and age, the logistician still lacks the ability to answer the simple question as to how much reliability or how much maintainability our weapon systems should have in a specific operational environment. The norm is all too often to review the requirements for the last weapon system and simply tack on modest improvements. Until we are able to analytically show the relationship between the operational environment and the requisite support requirements for a weapon system, the logistician will only be speaking in terms of vision and not the necessary engineering calculus to translate requirements into design.

Even with these design tools, we face a third component of our mosaic. *Until we can develop and acquire a weapon system that never breaks and does not need to be serviced with fuel and munitions*, the combat potential of any aircraft is only inherent. Only when they incorporate supportability features and are coupled with an effective combat logistics infrastructure, will these aircraft become effective instruments of air power. For the past three decades, we have seen the Air Force follow the trend of more and more centralization of logistics functions in pursuit of cost savings. That pursuit has been shortsighted. Concurrently, as we view the past 15 years, industry and the Air Force have designed more and more of our weapon systems so that they are reliant on a fixed-base infrastructure. For example, the advent of the digital computer has provided us with the ability to extract more capability from each aircraft than we ever would have deemed possible even a few years ago. But with every advantage it has given the pilot, it has created a major infrastructure burden for the logistician—and, therefore, for the operational commander and the military operation itself. The relentless pressure to save manpower and money has also forced us to consolidate maintenance functions, build electrified ramps, or construct fixed refueling pits. The net result is that we have allowed air power to become limited by its own infrastructure.

This challenge becomes, then, an important part of the mosaic. The objective must be to expand the strictures of that infrastructure so *air power may regain its greatest advantage—flexibility*. That will not be easy. It will require us to break a lot of mind sets about how things must be done. We must return to the premise that the basic fighting unit of the Air Force is the squadron, and we must allow it to operate unhampered by infrastructure limitations.

The last component of our mosaic deals with the main theme of this meeting, *the commodities themselves—spares, munitions, fuels, repair parts, etc*. We must continue to perfect the way we quantify our requirements and the way we contract for and price these commodities.

The members of Congress, acting for the American taxpayer, have a right to demand that we not pay exorbitant prices for simple parts. Let me assure you that, as a professional logistician and as a fairly experienced manager, I do not enjoy thinking about the conclusions which, if I were Joe Taxpayer reading the papers, I would find inescapable and inexcusable. That conclusion is that we are at worst stupid, and at best, incompetent—that the aerospace industry is a den of thieves, and that we collectively are parasites on the body politic.

I do not believe for a minute that either is true. But neither industry nor the military can ever afford that perception.

As I am sure you are aware, we have been spending a lot of time working this area. Last summer both the Secretary of the Air Force, Verne Orr, and the Chief of Staff, General Charles

Gabriel, tasked Major General Dewey K. K. Lowe, Commander, Sacramento Air Logistics Center, to study the entire spare parts acquisition process. This Air Force Management Analysis Group, or AFMAG, provided to the Secretary one of the most comprehensive reports on spare parts acquisition that I have read. We made wide distribution of this report both to industry and the Congress. If you have not read the study, I would strongly recommend you, at the very least, read the first volume which is an expanded executive summary.

General Lowe and this group divided their findings into *five* major areas. *The first dealt with how we do our requirements* computations and how existing financial and budget policies impact the way we buy spares. While many of these recommendations will require major policy changes on the part of the Office of the Secretary of Defense (OSD), the net effect of these recommendations will be to allow us to place larger quantities of spares on order, thus driving down unit cost. We have already taken action to reduce our cost to order by consolidating our purchase requests and adjusting our economic order quantity (EOQ) buy periods.

The next area dealt with *those actions taken or not taken* early in the weapon systems acquisition process which allow replenishment spares to be economically procured by the Air Force Logistics Command (AFLC). This included many recommendations in the area of initial provisioning actions, data requirements, and the subject of data rights. The Secretary of Defense, Caspar Weinberger, has tasked all the services to negotiate firm dates in new contracts, after which the government will receive unrestricted rights to data. Secretary Orr then took this a step further and, in September, directed the implementation of a contract provision that provides the Air Force with unrestricted rights in data not later than 60 months after initial delivery of a production item. We have this on the books today, with waiver authority, and it would be an understatement to say that it has been greeted with open arms by industry. However, it is important to realize that the Secretary's policy is mild compared to some of the legislation currently being introduced in Congress.

Please make no mistake—we all understand that the fundamental issue in data rights is the protection of a corporation's trade secrets. It is their edge over domestic and foreign competition, their profitability, and their survival, all rolled up into one term. The Department of Defense (DOD) often seeks incorporation of trade secrets into our weapons that offer significant technological advantages and cost avoidance that the government would otherwise have had to fund. Yet, if a corporation uses, or rather should I say "abuses," its proprietary rights to charge excessive prices or to inhibit development of a sound defense industrial base, we all suffer. Secretary Orr is emphatic that neither we nor the American taxpayer can tolerate such abusive practices which unnecessarily inflate the cost of defense.

Therefore, what the Air Force and DOD are trying to develop are policies and practices which appropriately recognize contractor proprietary rights, yet enable the government to obtain reasonable prices and an enhanced defense industrial base.

The third area of the AFMAG report gets to the heart of *our contracting and pricing techniques for spare parts.* Notwithstanding the data rights questions, this area of pricing will have the most direct impact on industry. There has been no question in my mind that we, in the aggregate, paid fair and reasonable prices for what we bought. What has happened is that, in our attempt to save time and manpower, we have *not done a good job of allocating the aggregate contract cost to individual items.* This has tended to distort the item price particularly on low value items which, not surprisingly, are the easiest to make the "hardware store" comparisons. Lieutenant General Robert D. Russ, Deputy Chief of Staff, Research, Development, and Acquisition, HQ USAF, and his Director of Contracting and Manufacturing Policy, Brigadier General Bernard L. Weiss, have been extremely gratified with the way industry has responded to our suggestion to change their accounting standard to price items more in line with their intrinsic value. Make no mistake—this does not change the bottom line. It just distributes the cost in a different way, or to use the accountant's language, the allocation now shows a causal or beneficial relationship to the item.

The last two areas of the report deal with how we manage spare parts in the postproduction time period. These recommendations cover a range of topics from how we should store and retrieve engineering data to recommendations on how we should motivate our employees. However, the major recommendation in this area prompted *the establishment of our competition advocacy program.* This is a dedicated group of people at each of our buying centers charged with the responsibility to increase competition and to manage our spare parts breakout program. They are also charged with accomplishing a value analysis on all the parts we will continue to buy in a sole source environment. While it is too early to make a judgment on the long-term benefits of this program, two things are apparent from reviewing our first two quarters of activity. First, the AFLC competition rate for replenishment spare parts has increased from approximately 23% to about 41%—this is good. Second, however, our administrative lead time has increased, which if not corrected, could have a longer term impact on readiness—this is bad. Bad or good, one thing is for sure—we are getting a lot of help. While I have only discussed our AFMAG report, we also are implementing the SECDEF's 10 and 25 point programs as well as anticipating passage of a spare parts reform act this session of Congress.

We are not trying to run anybody out of business or take advantage of our position as a sole source buyer. We are trying to regain and retain the faith of the American taxpayer. We have to get acquisition costs under control, and we have to ensure that every dollar we spend is worth the investment. Both the military and industry representatives to this conference are important to this effort. Innovative, creative solutions to the problems we face are not solved by one side or the other. We all need to work the acquisition problems and consistently ensure that the competitive environment in weapons acquisition is exactly what *we* want it to be.

What we need is a thorough review and scrutiny of the prices we pay for all systems, spares, supplies, and services; we need to challenge prices when they are not related to intrinsic value. Competition, cost consciousness, cost avoidance, and cost reduction have to become a way of life in the Air Force.

But no one organization or group can do the job alone. It will take the best efforts on all our parts—the DOD and industry—to fix our problems.

Politico-Military Aspects of Security Assistance Programs in the US Central Command's Southwest Asia Region

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Abstract

With the establishment of the US Central Command (USCENTCOM) on 1 January 1983, as the evolutionary successor to the Rapid Deployment Joint Task Force (RDJTF), an important milestone occurred for United States (US) military policy and strategy in the critical Southwest Asia (SWA) region. The linkage between our politico-military objectives and security assistance programs in the area, with particular attention to the role Air Force programs have in meeting US national security objectives, is key to understanding our role. CENTCOM's formation, together with its assumption of security assistance, gave credibility to US determination to protect "vital interests" in a region undergoing severe political tremors, most notably the Soviet invasion of Afghanistan, the fall of Iran, and the four-year Iraq-Iran War.

This article notes several elements in national military policy designed to achieve politico-military objectives, to include facilities access agreements, joint military exercises, prepositioning of assets, military construction, and security assistance. CENTCOM, unlike other unified commands such as European Command (EUCOM) or Pacific Command (PACOM), has *no* permanent military presence in the area, *no* host nation agreements, and *no* bases. But it does have very substantial security assistance programs which provide the *only* in-country presence and interface with host nation military establishments. Air Force programs are the largest and have the potential to make the strongest impact in meeting our objectives.

Two countries in CENTCOM's area—Egypt and Saudi Arabia—are singled out based upon the vital role each country plays in the Arab world, its geostrategic location, and sizable US Air Force programs in place or on order. These programs, centered around F-5s, F-15s, F-16s, AWACS/tankers, etc., plus related ground support, infrastructures, and training, are designed to promote self-defense against outside threats. Hopefully, this article demonstrates that Air Force security assistance programs in CENTCOM's region are the "cutting edge" and the first line in US military strategy and national policy for a vital sector of the world.

Introduction

On 1 January 1983, the USCENTCOM, the sixth and newest unified command, officially was established, with its main headquarters at MacDill AFB, Florida. It marked an evolutionary development of the RDJTF and gave credibility to the President's State of the Union Address of January 1980, wherein he vowed that the US would do whatever was necessary, including the use of military force, to protect vital US interests in the SWA region, with particular reference to the oil flow from the Persian Gulf through the Strait of Hormuz.

To reach that goal, more than a quarter of a million military personnel from all services, plus tactical aircraft, airlift, sealift, and naval carrier battle groups, have been earmarked as available to a deployment force to project as rapidly as possible US military power into the region if US interests are threatened.

CENTCOM is and remains, first and foremost, a deterrent force. But if deterrence fails, it will become an instrument of the national command authority, operating through the Joint Chiefs of Staff, to support national political and military policy in SWA.

"Southwest Asia" has, over the past few years, become an umbrella term to geographically describe and encompass the many countries in the region extending from Pakistan/Afghanistan westward to include Egypt (but not North Africa), southward to include the Horn of Africa and Kenya, and the entire Arabian Peninsula, and the waters of the Persian Gulf and Red Sea. In the Middle East proper, it includes Jordan and Iraq, but excludes Israel, Lebanon, and Syria.

Southwest Asia has been referred to as our third "strategic zone," after Europe and the Pacific regions. Each of these three zones now has a major unified command responsible for defending US "vital interests." The geopolitical and strategic importance of SWA cannot be overemphasized, since it is the landmass which links the continents of Europe, Asia, and Africa. It is the center for much of the world's commercial and naval sea lines of communication, with the Persian Gulf and its oil the most important part. The critical Suez Canal links the Mediterranean with the Indian Ocean, but that waterway is viable only so long as the southern terminus of the Red Sea at Bab el-Mandeb is open. Bab el-Mandeb is important to both Israel and Jordan for commercial shipping to the south since it allows water traffic to the ports of Eilat and Aqaba through the Strait of Tiran at the southern end of the Sinai Peninsula. And the Strait of Hormuz, another choke point lying some 20 miles wide between Oman and Iran, is absolutely vital to the Free World's flow of oil from the Persian Gulf. To complete the picture, Saudi Arabia and the Persian Gulf lie at the epicenter of the region. Thus it follows that all the strategy, planning, training, and other elements of national military policy in the region revolve around access and deployment to the region.

National Military Strategy and Policy

Presence is the name of the game—*regional presence*. US national policy and strategy are best served when there are large, well-equipped, and permanently stationed troops and equipment in a region, such as in Europe (EUCOM) and in the Far East (PACOM). In SWA, there is no stationing of troops, no host country arrangements, and no strong or credible regional presence of a permanent or semipermanent nature. Regional politics and attitudes preclude the near-term presence of US military forces, particularly as they relate to the overriding Arab-Israeli issues, the Palestinian problem, and Arab suspicions and perceptions of the US-Israeli relationship.

Regardless, an alternative to a US in-country regional presence, albeit a less desirable method, is to obtain en-route access rights, limited peacetime continuity, use of air and naval facilities, and regular (and impressive) deployment and joint training exercises with friendly indigenous military forces.

To do this, the US has signed access agreements allowing for the selected use of designated air and naval facilities in Oman, Kenya, Somalia, and Morocco under certain conditions. Additionally, Egypt has provided verbal assurances, as underwritten in a letter from the late President Sadat, for the possible use of selected Egyptian air, ground, and naval facilities in the event of a Soviet incursion into the SWA region. Other agreements and understandings exist between the US and friendly regional countries, including the long-standing agreement with Bahrain to provide administrative and logistical support to the US Navy's Middle East Force which has operated continuously in the Persian Gulf since 1949.

With the outbreak of the Iran-Iraq War in September 1980, and at the request of the Saudi government, the US has operated several E-3A AWACS and refueling tanker aircraft in the Kingdom and is expected to do so for the next several years. In the Indian Ocean, and "over-the-horizon," the US maintains almost continuous naval patrol with rotating carrier battle groups (CBGs)—the so-called "Fifth Fleet." Aside from the peacekeeping forces maintained in the Sinai (the Multi-National Force and Observers (MFO)), there is no major US military presence in CENTCOM's area of responsibility. CENTCOM established a forward headquarters element for the command aboard the Middle East Force flagship.

Security Assistance

While forward deployed forces positioned in strategic locations in the SWA region would be the most visible and credible evidence of US determination to protect vital interests, there is an important element in national military policy and strategy equally valuable: security assistance. Our security assistance programs, both worldwide and those centered in SWA, provide friendly nations with the necessary military equipment and training to provide for their own regional defense capabilities while simultaneously meeting our national security objectives. In particular, the military training provided to foreign military personnel—especially that in CONUS—allows the US to obtain a long-term benefit in influencing the future senior military and political leaders toward Western ideologies and democratic principles. In-country security assistance offices (SAOs), operating as Offices of Military Cooperation (OMCs), Military Assistance Advisory Groups (MAAGs), US Military Training Missions (USMTMs) (in Saudi Arabia), and attaché offices, provide a direct and "up-front" military-to-military relationship with the host military establishment. Sales of US military equipment, such as air defense systems and aircraft, would contribute to the desired development of an integrated and interoperable system; this is particularly true for Saudi Arabia and the Gulf states. Collateral benefits include the development of doctrine, tactics, command and control (C^2), etc., that parallel US systems and thereby immeasurably add to the interoperability of deployed US military forces of CENTCOM.

A brief analysis of CENTCOM's area of responsibility (AOR), plus that of Israel (which is the EUCOM's AOR), reveals that approximately 75% of *all* programs (military and economic aid) on a worldwide basis are in the SWA and Middle East regions. Two countries alone—Israel and Egypt—receive more than two-thirds of all foreign military sales (FMS) planned for FY84. Not included in these figures is the total for Saudi Arabia and other Gulf states which are cash customers and, for obvious reasons, are not in need of FMS loans or economic assistance. Saudi Arabia has, over the past 30 years, cumulatively purchased close to $60 billion in military equipment, construction/infrastructure, and training which includes the $8½ billion negotiated in 1981-82 for the AWACS/tanker sale and the "enhancement package" for the F-15 program.

Thus three countries in the region—Saudi Arabia, Egypt, and Israel—comprise the major portion of all US security assistance programs; together, they have "on the books" close to $17½ billion in on-going FMS, international military education and training (IMET), and cash sales programs. For the purposes of this paper only, two of the three countries in CENTCOM's AOR, Saudi Arabia and Egypt, will be briefly reviewed for their importance in the overall politico-military strategic interests of the US. (See Figure 1 for proposed FY 1984 security assistance programs.)

PROPOSED FY 1984 SECURITY ASSISTANCE PROGRAMS: USCENTCOM AOR + ISRAEL & LEBANON

COUNTRY/AREA OF RESPONSIBILITY:	DEFENSE DEPARTMENT PROGRAMS FMS	+ MAP	+ IMET (#)	= SUB-TOTAL	STATE + ESF/PKO	= DOD+STATE TOTAL
EGYPT ONLY (IN USCENTCOM'S AOR)	$1300	--	$ 2 (435)	$1302	$ 787	$2089
ALL OTHER USCENTCOM/SWA COUNTRIES	472	140	8 (1093)	620	475	1096
SUBTOTAL: ALL USCENTCOM COUNTRIES	$1772	$140	$10 (1528)	$1922	$1262	$3184
+ ISRAEL (EUCOM'S	1700	--	--	1700	785	2485
+ LEBANON AOR)	15	--	1 (155)	16	50	66
TOTAL US CENTCOM COUNTRIES + OTHER MIDDLE EAST COUNTRIES	$3487	$140	$11 (1683)	$3638	$2097	$5735
REST OF WORLD	949	562	46 (7299)	1557	480	2037
WORLD TOTAL	$4436	$702	$57 (8982)	$5195	$2577	$7772
PERCENTAGE OF:						
EGYPT + ISRAEL TO WORLD TOTAL	68%	na	2% 5%	58%	61%	59%
ALL USCENTCOM COUNTRIES TO WORLD	40%	20%	18% 17%	37%	49%	41%
ALL USCENTCOM COUNTRIES + ISRAEL	79%	20%	19% 17%	70%	81%	74%

FOOTNOTES:
(1) Amounts shown above in millions of dollars. All amounts subject to further change.
(2) (#) = Number of students in International Military & Education Training Programs.
(3) Abbreviations: FMS = Foreign Military Sales.
MAP = Military Assistance Programs.
IMET = International Military & Education Programs.
ESF/PKO = Economic Support Funds/Peacekeeping Operations.
(4) Dollar amounts for Lebanon have already changed upwards dramatically due to politico-military factors and US involvement in that country.
(5) Source document for above presentation is the CPD - Congressional Presentation Document.

Figure 1.

Saudi Arabia: "Central" to USCENTCOM

As noted earlier, Saudi Arabia's oil wealth and production capabilities, together with its leading role in the birth and sustenance of the Islamic Faith throughout the Arab and Moslem world, is critical to the Free World's economic viability. Politically, it plays an important role as financier and facilitator among the Arab states when it comes to overall Arab-Israeli and Palestinian issues. Table 1 shows a summary review of present Air Force oriented Saudi programs over the next five years.

The outbreak of the Iran-Iraq war in September 1980 provided strong impetus for the later negotiated AWACS and F-15 "enhancement package" sale to Saudi Arabia. Perhaps no other assistance program created as much controversy in the public press and government-to-government relations, particularly with Israel. This package, which will not become fully effective until later in the 1980s, is defensive in character and contains the necessary capabilities for the Royal Saudi Air Force (RSAF) to develop a meaningful air defense system

		BILLION DOLLARS	
F-5 E/F PROGRAM:	96 AIRCRAFT	$ .3B	
	LOGISTICS, CONSTRUCTION, TRAINING, AND SUPPORT SERVICES	1.4	
	AIR-TO-AIR MISSILES	.1	
			$ 1.8B
F-15 C/D PROGRAM:	60 AIRCRAFT + SPARES	$2.5B	
	CONTRACT MAINTENANCE AND SUPPORT	1.1	
	FACILITY CONSTRUCTION	.7	
	CONFORMAL FUEL TANKS AND AIR-TO-AIR MISSILES (AAMs)	.2	
			4.5B
5 AWACS + 6 TANKERS PROGRAM (TOTAL):			3.2B
C^3 AND MUNITIONS PROGRAM (TOTAL):			.6B
		TOTAL	$10.1B

Table 1.

against possible air attacks. Because Saudi Arabia has actively supported and financed much of Iraq's requirements in its continuing war with Iran, the reality and possibility of Iranian retaliation against Saudi Arabia remain high.

Israel, on the other hand, has viewed this sale as a threat to its security, particularly if the AWACS aircraft and the F-15s operate in the northwestern quadrant of the Kingdom near the Jordanian borders. It is expected that the system will, when operational, be centered around the critical Ras Tanura oil fields and distribution terminals on the Persian Gulf. Additionally, it is expected that US training teams will be required for the foreseeable future to assist the Saudis in the technological absorption of the aircraft and C^3 systems.

One of the long-range collateral benefits of the AWACS/F-15 package is for a desired regional integrated air defense system to include all the members of the Gulf Cooperation Council (GCC - Saudi Arabia, Kuwait, Bahrain, Qatar, the United Arab Emirates (UAE), and Oman). Admittedly, this may be an elusive military goal, given the diverse political forces at work in the Gulf.

Because of its vast wealth and preeminence in the Arab world, Saudi Arabia will continue to be of "vital interest" to the US and the Free World. It is therefore imperative that the US maintain its "special relationship" with the Saudis, principally through the operation of the US military training mission in that country.

Egypt: A New and Special Relationship

Two very significant political events, in 1973 and in 1974, led to the third event (in 1977) which established the US in a special relationship with Egypt. The October 1973 Ramadan War (or Yom Kippur War to the Israelis), with its initial Egyptian military victories in breeching the Suez Canal and driving into Israeli-occupied Sinai, provided the Egyptians with a great psychological impetus in their relations with Israel. This was followed in 1974 with the expulsion of some 15,000 Soviet "advisers" from Egypt. In turn, President Sadat felt he had earned a new mandate in developing Egypt's political and military future, and the resulting historic journey to Jerusalem in November 1977 became the premier event in the region. That event in turn led to a special trilateral relationship with the US, Israel, and Egypt which resulted in the March 1979 Peace Treaty, the Camp David Accords, and total Israeli withdrawal from the Sinai in April 1982.

The complete reliance of Egypt on Soviet-supplied arms over the past 20 years was at an end. The single most important military requirement now was for Egypt to rebuild and restructure its armed forces in all areas, particularly its air forces and air defense assets. As a result, the reconstitution of the Egyptian Air Force (EAF) from MiGs and Sukhoi aircraft to the F-16 system was put at the top of the modernization/reequipping program.

From an Air Force perspective only—and excluding army and air defense assistance—the present program calls for about $2.8 billion planned over the next few years:

20 C-130s (two have crashed)	$ 263M	
35 F-4s (one has crashed)	423M	
40 F-16A/Bs (all delivered) (one aircraft has crashed)	921M	
40 F-16 C/Ds (delivery in 1986)	1212M	
TOTAL	$2819M	= $2.8B

It is obvious that Egypt desires requisite forces not only to protect its own borders but also to play a key stabilizing role in the Middle East by aiding its neighbors—principally Sudan—against the real and perceived threats emanating from Libya, the Soviet Union, and Iran. Among its aims is the establishment of aircraft and engine licensed production lines to provide inventory aircraft for the EAF and to standardize fighter aircraft among Arab nations in the region. It plans to establish a maintenance facility capable of handling Soviet-built, French, and US fighters from throughout the region. It should also be noted that while the F-16 program (40 now and 40 later) is important to the EAF, an essential element of the Egyptian Ministry of Defense procurement policy is to diversify the inventory. This includes plans for possible coproduction of a first-line fighter (F-16A, F-20, or Mirage 5);

purchase of at least 40 Mirage "2000" now (and an additional 40 later); and the purchase of 80 Chinese-built/assembled F-7s later (based upon the MiG 21 design). The latter aircraft, at only about $3 million per copy, are affordable when compared to the expensive F-16s and, over the long run, the EAF hopes to have as many as 160 F-16s in its inventory.

Additional Egyptian Air Defense Forces modernization programs, throughout the 80s, will easily exceed $1 billion. This includes purchase of early warning aircraft (E-2Cs, at about $700 million), various radars/C^3 systems and studies ($152 million), and I-Hawk air defense systems, computerized logistics, and identification, friend or foe (IFF) systems.

The US security assistance mission in Egypt, operating within the embassy as the OMC, is second in size in CENTCOM's region (after USMTM-Saudi Arabia). It manages four technical assistance field teams associated with Air Force programs: the F-4, C-130, F-16A/B, and F-16C/D. The OMC operation in-country is the only viable presence the US has from a military perspective, and it is increasingly important that it remain an effective proponent of military and diplomatic policy in that critical country. Much of CENTCOM's access, deployment, and staging into the region depends on the military cooperation between the US and Egypt.

Summary

Table 2 briefly summarizes the total dollar value of the remaining Air Force programs for the region. This further emphasizes that **US security assistance programs in CENTCOM's region are, without a doubt, the most important elements in the overall political and military policies designed to "protect our vital interests" in a clearly strategic part of the world.**

USCENTCOM COUNTRY	TOTAL AIR FORCE VALUE OF PROGRAMS ($ MILLIONS)
SAUDI ARABIA	$10,126M
EGYPT	2,819M
SUDAN	126M
KENYA	82M
OMAN	79M
JORDAN	37M
SOMALIA	34M
N. YEMEN (YAR)*	17M
UAE + BAHRAIN + KUWAIT	20M
USCENTCOM TOTAL:	$13,340M
+ ISRAEL	4,501M
TOTAL REGIONAL:	$17,841M

* As an interesting and parenthetical point, North Yemen is the only country in the world which has both US and Soviet advisers and assistance programs designed to protect it against the regular and recurring threats emanating from the Peoples Democratic Republic of Yemen (PDRY), the only avowedly Arab-Marxist state in the world and totally supported by the USSR!

Table 2.

▶ FROM 37

READERSHIP SURVEY (SPRING ISSUE)

1. What is your current status?

Active USAF	**46.5%**	Other DOD Civil Service	1.5%
ANG or USAF Reserve	6.1%	Non-DOD US government employee	.4%
Other US military	2.9%	Education	1.1%
Other national military	.4%	Business/industry	4.4%
USAF Civil Service	**36.0%**	Other	.7%

2. What is your rank/grade?

General officer	.7%	GS-16 through GS-18	.6%
0-4 through 0-6	**29.7%**	GS-13 through GS-15	16.2%
0-1 through 0-3	16.2%	GS-9 through GS-12	18.1%
E-7 through E-9	6.8%	GS-1 through GS-8	.4%
E-1 through E-6	3.0%	Wage grade	.2%
Gov't civilian appointee	2.6%	Non-government employee	5.5%

3. Which major field best describes your current job assignment?

Supply	12.0%	Logistics & Engineering	10.7%
Maintenance	12.5%	Resource Management	4.3%
Contracting	5.0%	Operations	1.1%
Transportation	5.0%	Education/Training	9.9%
Logistics Analysis	6.4%	Research/Studies/Analysis	4.1%
Logistics Plans/Programs	14.2%	Other	6.4%
Systems Acquisition	5.8%		
Engineering and Services	2.6%		

4. How do you normally obtain the *AFJL*?

Official USAF distribution (PDO)	55.2%	AFLMC distribution	8.8%
		Library	8.6%
GPO subscription	5.3%	Coworker	4.3%
OCPO distribution	11.6%	Other	6.2%

5. How many readers do you estimate see your quarterly copy of the *AFJL* or the one that is routed to you?

Only myself	11.6%	Eleven to fifteen	7.3%
One to five	38.6%	Sixteen or more	10.9%
Six to ten	22.0%	Do not know	9.6%

6. A. How many copies of the *AFJL* are distributed to your duty section through official USAF channels?

Not eligible for official USAF distribution	6.7%	Five to nine	5.9%
		Ten or more	2.2%
None	19.2%		
One to four	66.1%		

B. Are you satisfied with the number of copies the *AFJL* distributed to your duty section through official USAF channels?

Not eligible for official USAF distribution	7.4%	Yes, just enough	67.7%
No, too few	23.7%	No, too many	1.2%

7. Eighteen quarterly issues of the *AFJL* have been published. How many issues have you seen?

This is the first	11.1%	Seven to eleven	30.7%
Two to six	32.1%	Twelve to eighteen	26.1%

8. How much of each issue do you usually read?

All	11.7%	One or two articles or departments	16.9%
Most	**40.7%**	Very little	2.3%
About half	25.5%	Look at but seldom read	2.9%

		Poor	Unsatisfactory	Satisfactory	Good	Excellent
9.	Layout	.8%	.6%	35.0%	**46.0%**	17.7%
10.	Type	.4%	2.4%	33.1%	**42.5%**	21.7%
11.	Proofreading	.0%	.8%	27.5%	**40.9%**	30.8%
12.	Graphics	.6%	1.8%	32.8%	**43.1%**	21.7%
13.	Article quality	.2%	3.2%	27.7%	**48.0%**	20.9%
14.	Article thoroughness	.0%	2.8%	31.5%	**50.4%**	15.3%
15.	Article variety	.8%	5.3%	33.3%	**46.0%**	14.5%
16.	Departments:					
	Current Research	.4%	3.4%	36.6%	**46.0%**	13.6%
	Career & Personnel Information	1.2%	7.3%	**39.3%**	38.9%	13.3%
	USAF Logistics Policy Insight	.2%	4.7%	35.0%	**42.6%**	17.5%
	Logistics Warriors	1.4%	3.3%	36.5%	**38.4%**	20.4%
17.	Pro/Con Quest	.9%	2.6%	**47.5%**	42.5%	6.6%
18.	Specials	.2%	2.3%	43.8%	**44.3%**	9.4%
19.	Items of Interest	.4%	2.1%	40.0%	**44.1%**	13.4%
20.	Back cover quotes and inside quotes	1.0%	3.1%	38.0%	**39.4%**	18.5%
21.	Overall relevance	1.0%	2.6%	23.4%	**47.6%**	25.4%

22. Do you, or does your office or organization, retain back issues of the *AFJL*?

Yes	58.9%	Do not know	21.9%
No	19.2%		

23. Which of the following describes the value of the *AFJL* to you?

Have used some contents in my work/professional life	47.8%	Informative-usually learn something from each issue	**54.7%**
Some ideas/information may be useful in the future	44.4%	Interesting	39.2%
Educational—increased my understanding of AF logistics	**60.0%**	Uninteresting	1.1%
		No value	1.5%

24. Do you agree or disagree that the *AFJL* meets its purpose: "... to provide an open forum for presentation of research, ideas, issues, and information of concern to professional Air Force logisticians...."?

Strongly agree	22.3%	Disagree	3.4%
Agree	**66.4%**	Undecided	7.3%
Strongly disagree	.6%		

25. How do you rate the *AFJL* in comparison with other logistics publications?

The best	6.0%	Below average	2.7%
Better than most	**54.1%**	I am not familiar with any other logistics publication	12.3%
Average	24.9%		

(Some readers compared the Journal to *Logistics Spectrum, Army Logistician,* and civilian sector pubs.)

26. What other regular departments or features would you like to have in the *AFJL*?

Analytical Tips	35.1%	Letters to the Editors	38.8%
Book Reviews	24.7%	Other	6.3%
Past Reflections	27.8%	None—leave as is	15.3%

27. Would you like to see more photographs in the *AFJL*?

Yes	45.9%	No	52.9%

We received 544 responses from a survey of approximately 6,350 readers (9%). An analysis of the 544 responses indicates that the Journal reaches its primary target readership (Questions 1 and 2), is a valuable and effective publication (Question 23), and meets its purpose as a professional Air Force journal (Question 24).

Our readers rated the physical appearance; article quality, thoroughness, and variety; departments; and overall relevance "GOOD." This indicates that we are satisfying the majority of our readers.

The Survey also identified areas in which the Journal can improve and suggested we publish more base-level articles in the future. Many readers recommended we feature a "Commentary" or "Attack/Counter Attack" section; we will try this new section in 1985. **Our goal for 1985 will be to make the Journal the best logistics publication.**

Personnel and organizations inside the Air Force can be placed on automatic distribution for the *AFJL* by notifying their local servicing PDO of their requirements for AFRP 400-1. Readers outside the Air Force can subscribe to the *AFJL* for $11.00 a year by writing to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

CAREER AND PERSONNEL INFORMATION

Civilian Career Management

Logistics Civilian Career Enhancement Program Transportation Program Expands

The Logistics Civilian Career Enhancement Program (LCCEP) has been in operation since October 1980. The intent of the program as stated in the implementing regulation is "to encourage and manage the development of logistics personnel to their fullest potential to meet the mission needs of the Air Force." LCCEP attempts to ensure the availability of employees who have the professional, technical, administrative, and managerial skills for logistics positions at various managerial and executive levels. The importance of these goals is apparent as the overall logistics mission becomes more complex and sophisticated with the introduction of constant advancements in technology. LCCEP is proving to be an effective method for planned career development and progression for Air Force civilian logisticians.

LCCEP initially applied to central position management and fill actions for grades GS-12 and above. Beginning 1 October 1984, LCCEP will expand its structure into a new dimension. A selected number of GS-09 through GS-11 positions in the Transportation 21XX occupational series will be added to the GS-12 and above positions already managed within the program. The purpose of this expansion into lower grades is to establish more meaningful career ladders and to provide an early opportunity for the energetic and resourceful transportation professionals to experience the broad range of transportation and logistics functions. This is a step toward the goal of ensuring a continuing source of highly qualified candidates for the senior logistics positions within the Air Force by providing planned career development and broadening opportunities.

Transportation has historically been a very narrow career field made more narrow by evolution. There is difficulty in maintaining an adequate civilian position structure to provide for the progressive career development of high-potential Transportation specialists. Contracting of base functions, which often includes many base transportation activities, reduces the number of developmental assignments available to civilian employees. Instability in the civilian position structure has resulted from the varying conditions and mission requirements which have influenced frequent conversions of positions between military and civilian classifications. Many commands have limited latitude in being able to develop their own career programs.

Further, a high percentage of Transportation positions are filled by retired military members. While their expertise and contributions are undeniable, their retainability averages 5 to 10 years at lower grades, leaving little time for them to qualify for the high grade executive positions. There is currently an extremely high percentage of retirement eligibles in the top managerial positions. And, any drastic change in civil service retirement policies could precipitate a rash of retirements, some in critical areas. LCCEP provides the mechanism necessary to enable the functional managers to recruit, develop, and broaden the experience of Transportation specialists throughout a 30-year career as they progress to the top positions.

Including lower grade positions in LCCEP offers significant advantages to potential managers and executives in the Transportation community:

- LCCEP assists in providing increased visibility and competition for jobs. Voluntary mobility opportunities will allow high-potential personnel to move out of dead-end positions into positions with progression possibilities, rather than departing a career field whose structure inhibits advancement.
- LCCEP allows individuals to participate and contribute while gaining multifaceted experience at various levels and in many functions of the Transportation and Logistics specialties.
- A stabilized concept of formal training and development will assist managers to plan for absences for training.
- Employees who plan for their career progression are more likely to move up into management ranks and be better prepared to cope with the logistics issues of the future.
- The direct involvement of senior executives is enhancing management of the work force and is providing a systematic approach for identifying and developing the managers and executives of the future.

LCCEP manages 58% of all Air Force Transportation positions, GS-12 and above, all GS/GM-14/15 positions, 35% of GS/GM-13s, and 25% of GS-12s. The additional positions at the lower grades comprise 15 percent of the total Transportation positions at each of the new grade levels.

Approximately 100 Transportation positions, GS-09 through GS-11, will be included initially. These positions will be competitively filled by Air Force employees identified in the Personnel Data System - Civilian (PDS-C) who expressed their geographic availability for the position location. More than 300 employees, GS-07 through GS-10, who are eligible for Transportation positions at GS-09 and above, registered in the program recently during the annual open season to participate in the expanded LCCEP.

As the LCCEP nears the completion of its fourth year of operation, it shows every sign of continued success and effectiveness in meeting its objectives.

Source: Hazel D. Ozee, OCPO/MPKCL, AUTOVON 487-5351

Military Career Management

What Can You Do To Be A Better Officer?

Often, AF logistics officers ask, "What can I do to be a better officer?" We, in the Logistics Assignments Section at HQ AFMPC, always emphasize three important points an officer should strongly consider throughout his career:

(1) Perform your current job to the best of your ability. You may wish to move to a different career field, but you will be evaluated on how well you perform your present job. Superior job performance will be recognized and become the impetus for assignments to more challenging, responsible, and satisfying positions. If possible, voluntarily perform additional duties. Outstanding performance of additional duties is recognized and sometimes serves as the "foundation" for selection of additional career-broadening experiences.

(2) Seek career counseling from supervisors, commanders, and others in positions of leadership. Their guidance can be of great value in helping you develop leadership. Also, become acquainted with the

TO 8 ▶

Air Force Retention Policy for Consumable Items - A Logistician's Problem

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The Air Force for 10 years has been scrapping millions of dollars of needed spare parts and then, in many cases, repurchasing them at higher prices from junk and salvage dealers. . . . Since 1974, Air Force procedures have called for automatic disposal of many spare parts, ranging from screws and nuts to airplane doors, if none had been requested within the past 12 months. . . . Time and time again, we came across instances that on maybe the 13th month, a requirement for that item came up, and we would go and the shelf was empty, and we would have to reprocure it.

Washington Post, 7 July 1984

The above excerpts explain in a nutshell the problem with the current Air Force base-level retention policy for consumable items: disposal of needed assets—assets for which the Air Force later had a requirement.

One very frustrating aspect of this premature disposal has been the recent Air Force policy change to acquire items more efficiently. As Lieutenant General Leo Marquez, Deputy Chief of Staff for Logistics and Engineering, HQ USAF, explains in the article, while the Air Force is buying in larger quantities, the assets "that we acquired very efficiently at the front end could go out the back door in accordance with established retention policy."

In March 1984, as a result of findings by the Inspector General, the Air Force declared a moratorium on the disposal of surplus military materiel and the Department of Defense (DOD) followed suit in July. We, at the Air Force Logistics Management Center (AFLMC), were tasked to study retail retention policy for consumable or economic order quantity (EOQ) items. In this article, we will describe our analysis, our recommendations, and our solutions. Currently, base-level excesses are stratified into two categories: partial and complete.

Partial Excess

A partial excess occurs when a computed demand level is greater than zero but less than the on-hand balance. A partial excess condition usually occurs because the demand level has decreased. Demand level decreases are the second largest cause of surpluses at base level, generating nearly 20% of the excess conditions or over 14,500 line items and $3 million per month Air Force wide. Using data from the Air Force Monthly Supply Management Report, we graphically illustrate the dollar amount of partial excesses generated Air Force wide every month (Figure 1).

There has been a significant increase in the dollar value of partial excesses since April 1982. Certainly, part of that increase is due to rising prices, but the main reason is a policy change implemented in FY82. Following DOD guidance developed from the Retail Inventory Management and Stockage Policy (RIMSTOP) study, the Air Force implemented a cost trade-off model that compares the economics of stocking an item versus not stocking an item. The model determines the range and depth of items to stock at the retail level; that is, it indicates when to start stocking an item and when to stop stocking an item. The current policy periodically runs every item through the range model. If the item does not have a demand level, yet meets the economic criteria to stock, a level is established. However, if the item has a demand level (it once met the criteria to stock), but no longer meets the criteria to stock, then the demand level is reduced. This, in turn, generates partial excesses.

As we mentioned, periodically we apply the range model to each item, whenever there is a demand for the item, or automatically on a semiannual basis, in March and September. *Look* at Figure 1 *again*. Note that April and October are the peak months for generating partial excesses. In reality, it is the current policy that generates apparent excesses.

Are these items really excess? Do we no longer have a need for these items? Does it really cost us more to hold these items than to dispose of them? The answer to all these questions is a resounding NO!

By analyzing three-to-five years of typical base-level data, we found that 67% of the items declared partial excesses were

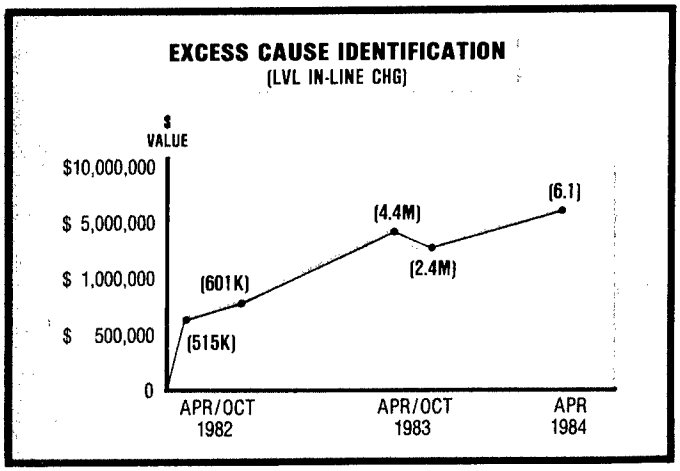

Figure 1.

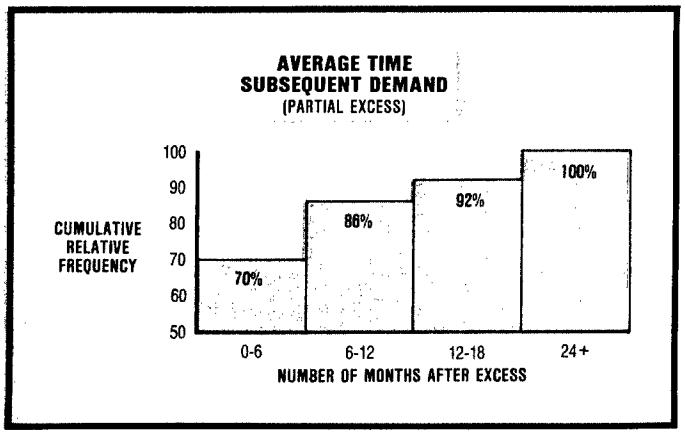

Figure 2.

in fact subsequently required. Figure 2 shows a frequency distribution for what we term, the amount of time until the next demand. Of the items that have a subsequent demand, 70% were needed within 6 months and almost all were needed within 18 months. We also found that partial excesses were relatively low in cost—90% cost less than $20. Over 80% of the partial excesses had an extended cost (number of units excess times the unit price) of less than $75. So, in many cases, it costs more to report these items excess and redistribute them than it costs for the units being shipped. We did a cost trade-off of our own and showed conclusively that it is more economical to keep partial excesses on hand at the base for well over three years than to redistribute them.

Therefore, we have recommended that the Air Force stop applying the current range model to items that have a demand level. Consequently, we will no longer decrease the demand level due to "economic" criteria. Demand levels can still be lowered, but only when based on a decrease in the daily demand rate.

Complete Excess

We conducted a similar analysis on complete excesses and the results were equally conclusive. A complete excess occurs when there is an on-hand balance and no demand level. By far the largest cause of complete excesses, or for that matter all excesses, is demand level deletions. Nearly 60% of the line items and over 50% of the dollar value of excesses are caused by deleting the demand level. This means well over $8 million of excesses are generated per month. Under what was then current policy, if any item has not experienced a demand in 12 months, the demand level was deleted and a complete excess was generated.

The same questions apply to complete excess items as they did for partial. Are these items excess? Do we no longer have a need for these items? Again, the answer is NO! After analyzing typical base-level data over a five-year period, we found that 35% of the items were in fact needed and did show a demand after being declared "excess." Figure 3 shows the average time it took to receive that demand. Fifty-two percent were needed within three months of being declared excess. In the case of complete excess items, AF base personnel sent many of these items directly to disposal upon being declared excess. Since most items in disposal rapidly lose their identity, we were discarding items that had to be reprocured.

Using the five years of data, we conducted a cost trade-off for complete excess items. Then we compared the cost of

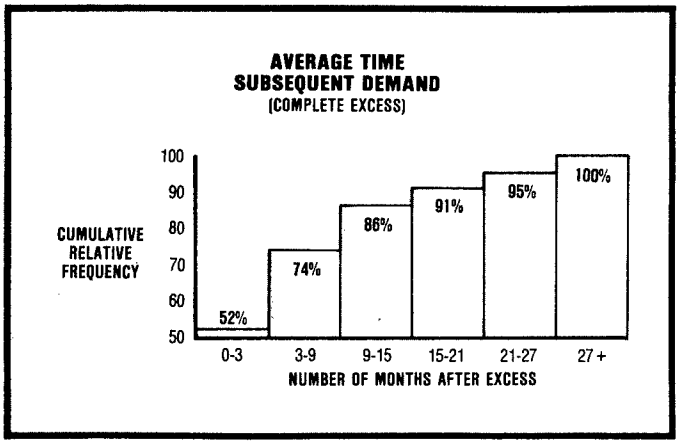

Figure 3.

holding every item that was declared completely excess under the current system to the cost of ordering and reprocuring 35% of the items that had a subsequent demand. That figure showed it was less expensive to hold all the excess items. The order and reprocurement cost was one-and-a-half times greater. The data is conclusive: we need to keep items longer. But what items do we need to keep? And for how long do we keep them?

We concentrated on these research questions:

(1) Is there a way to identify items that will have subsequent demands?

(2) If so, can we more wisely select which items to keep?

To answer these questions, we used sophisticated statistical techniques to determine if excess items possessed some factor or factors that made them more likely to be needed after not having a demand in 365 days. We tried several factors without success, including the price, the amount of units excess, the dollar value of units excess, the cause of excess, and the type of item. None of these had any predictive impact. However, we found two factors that were significant: the number and the priority of previous demands.

We counted the number of demands in the two-year period prior to being declared excess to see if there was a difference between an item that had subsequent demands and one that did not. Table 1 shows the results.

AVERAGE DEMAND
(Two Years Prior to Excess)

	WITH SUBSEQUENT DEMAND	WITHOUT SUBSEQUENT DEMAND
AVERAGE DEMAND	1.4	.4

Table 1.

Thus, the more demands in the two years prior to becoming excess, the higher the probability of having a subsequent demand. But this is not foolproof. Some items with a subsequent demand had no previous demands in that two-year period. Therefore, we needed some other factor to ensure we kept items that had a subsequent demand. We thought it was all right if we kept some items that did not have a subsequent demand, but we wanted to maximize the probability of keeping items subsequently needed.

The other factor we needed was the priority of demands prior to the item becoming excess. The current system has a stockage priority code (SPC) on all EOQ items which measures that priority. Table 2 defines the five stockage priority codes.

The current system assigns a stockage priority code on the first issue request for an item. The SPC can be upgraded if a higher priority issue request is received. The SPC is also downgraded by 1 if there is no demand in 90 days. The SPC is downgraded from 4 to 5 if there is no demand in 180 days. To illustrate, suppose an "A" issue request is received on day 0 and there are no subsequent demands. An SPC of 2 is assigned. After 90 days the SPC is downgraded to 3, after another 90 days to 4, and after 180 more days to 5. Thus, on day 360, an SPC of 5 would be assigned.

Table 3 shows the results when we compared the minimum SPC for an item in the two years prior to being declared excess

for those items with a subsequent demand to those without a demand.

STOCKAGE PRIORITY CODE	
CODE	DEFINITION
1	ANY REPORTABLE MISSION CAPABILITY (MICAP) OR PRIORITY AWAITING PARTS REQUEST
2	"A" URGENCY JUSTIFICATION CODE OR OTHER AWAITING PARTS REQUEST
3	"B" URGENCY JUSTIFICATION CODE
4	"C" URGENCY JUSTIFICATION CODE
5	OTHER

Table 2.

MINIMUM SPC (BEFORE EXCESS)	PERCENT WITH SUBSEQUENT DEMAND
1-4	59%
5	36%

Table 3.

The higher the priority of the issue requests prior to being declared excess, the higher the probability of a subsequent demand.

NUMBER OF PREVIOUS DEMANDS FOR ITEMS WITHOUT SUBSEQUENT HITS (SPC 5)	
NUMBER OF DEMANDS	PERCENT ITEMS
0	76%
1	15%
2	5%
3	2%
4+	2%

Table 4.

Now we put the two factors—SPC and number of demands—together. In the five years of data we studied, there were 1,922 items that did not have a subsequent demand after being declared excess. Over 96% (1,838) of those items were SPC 5 in the two years prior to being declared excess. Table 4 shows the number of previous demands for those 1,838 SPC 5 items. Thus, 73% of all the items (1,922) which did not have a later hit were items with an SPC 5 and no demands in two years. Therefore, we recommended the following guideline for Air Force implementation:

Items are declared completely excess after

2 years with no demands
and
2 years of stockage priority code 5.

With the data analyzed, this rule ensured that 95% of the items that had any subsequent demand were automatically retained. The beauty of the rule is that it retains high priority items—items that are stocked earlier—for a longer period of time. For example, an item that generates a grounding condition is assigned an SPC 1 and, under current policy, is immediately stocked. If there are no further demands for this item, it will be retained for 3 years and 3 months, because it will take 1 year and 3 months before the SPC is downgraded to a 5.

Impact on Mission Support

Our recommended retention policy changes, which extended the retail level retention period to at least 30 months, have recently been implemented Air Force wide. Not only will these changes save the Air Force money, but they will significantly improve the operational capability of our weapon systems. Based on our analysis, we estimated that the longer retention period will increase the aircraft mission capable rate by 1%. That translates into 700,000 more mission capable hours.

General Marquez was correct when he said retention was a very, very complex problem. In another *Washington Post* article, 11 July 1984, Ms Gilleece, the Deputy Undersecretary of Defense for Acquisition Management, denied that disposing of excesses prematurely was a systematic problem but rather ". . . an implementation problem, a logistician's problem." Well, it is a problem we at the AFLMC tackled and we will continue to tackle problems like these! Improving logistics to support the Air Force mission is a challenge we willingly face now and in the future.

"The postponement of operations to accumulate munitions reserves tended to prolong the war since it left both sides with enough munitions to avoid defeat but insufficient to win."

L. I. Farrar, Jr. in *The Short War Illusion: German Policy, Strategy and Domestic Affairs, Aug-Dec 1914.*

The Metamorphosis of a Command: AFLC in Transition

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Abstract

The Air Force Logistics Command (AFLC) has traditionally evaluated its efficiency through internal, commodity-oriented criteria. This practice has been at variance with operational commands that have traditionally measured performance by the effectiveness of their weapon systems. In recognition of this disparity and twin responsibilities for improving Air Force sustainability and responsiveness, the command has begun a dramatic metamorphosis that focuses on the combat effectiveness of the weapon systems it supports. This transformation involves rejuvenation of the command's system management structure and a new Meaningful Measures of Merit Program, both intended to rechannel AFLC energies and imagination toward improving the Air Force's ability to go to war.

Background

General James P. Mullins, Commander, Air Force Logistics Command, startled many readers with his assertion in the August 1982 issue of *Air Force Magazine* that the Logistics Command is an "operational rather than a support command."[1] Although General Mullins' comment is perhaps exaggerated if taken literally, it signals a significant metamorphosis in the command's contribution to the Air Force's operational capability. Generally viewed as a huge, poorly stocked spare parts warehouse or as a giant unresponsive repair depot, the command has devoted a great deal of effort toward shedding its "box kicker/label licker mentality" and recognizing its responsibilities in developing combat capability for war. These changes are largely internal and unquantifiable, and are thus relatively unknown outside the logistics community, but they portend a positive impact on the readiness capabilities of the operational commands.

Twin Mandates for Change

After a much needed period of intense force modernization (F-15, F-16, A-10, and E-3A), the Air Force has shifted its focus to the combat supportability of weapon systems. Oftentimes, acquisitions of weapon systems focus on the immediate concerns of cost, schedule, and performance and mortgage for later considerations of logistical support. This concern usually leaves the "maintainers" playing catch-up to ensure that systems are available to wing commanders and sustainable for the full prosecution of post-D-Day missions. For example, Air Force budget priorities in the recent past largely ignored key readiness materiel. In fact, the latest Department of Defense (DOD) guidance notes that this country is "far short" of a sustaining capability in materiel to support conflicts in Europe, the Persian Gulf, and Korea. Therefore, the Reagan Administration has proposed a five-year, $100 billion program to ameliorate this situation.[2]

However, money and materiel are only part of the changing defense picture. A second phenomenon is the growing realization that battlefields of the future will require different responses from those in the past. Significantly, planners envision little warning in future conflicts, and "come-as-you-are-wars" will not allow long periods for reflection and industrial mobilization. This dilemma imposes enormous pressure on the logistics structure not only to determine in advance the assets that will be needed for each threat scenario but also to purchase and stock those parts prior to the occurrence of hostilities. In short, logistics priorities must shift from what is needed for peacetime to what will be needed for war-fighting, and such a reorientation requires new and innovative approaches to logistics support.[3]

Psychological and Structural Deficiencies

Responsibility for these twin mandates falls on the AFLC in its mission of providing logistics, materiel, and services support to all United States Air Force (USAF) units around the world. Historically, however, the Logistics Command has been ill-equipped psychologically and structurally to deal with these challenges.

The psychological problem has been rooted in a basic dichotomy of perspectives between the Logistics Command and the operating commands. Stated simply, the operators are mission- and, hence, weapon system-oriented while the Logistics Command has been commodity- or item-oriented. The using commands view their weapon systems as basic elements in performing their assigned missions, and they have constructed their information and management systems around them. Thus, they deal with program element codes and major force programs and use sorties and number of aircraft operationally ready—all tied to specific weapon systems—as their key management indicators. Logisticians, on the other hand, tend to view weapon systems as combinations of items and subsystems and focus their attention on management indicators concerned with item inventories measured in terms of commodity back orders, fill rates, and depot-repaired items regardless of their significance to weapon systems. Items became ends in themselves, divorced from their ultimate applications.

This psychological bias was reenforced by evolutionary changes in the AFLC organizational structure. Although the command's logistics operations generally fall into categories pertaining to weapon systems and items, the historical ascendance of item management has been clear. In the early 1960s, the predecessor of today's system manager, the system support manager, had his materiel management, distribution, maintenance, contracting, and planning functions in one location. But so-called "economy" moves in the DOD led to the growth of the General Services Administration (GSA),

Defense Logistics Agency (DLA), and interservicing, all changes which reduced the system manager's authority and control and vastly multiplied his problems of coordination. Further specialization resulting from the growing technical complexity of logistics strengthened the item management structure. As determinations of commodity requirements and engineering fixes became more complicated, item management organizations rather than the system managers became the real repositories of technical expertise and the single face to the using commands. The dominance of item management was further entrenched in 1976 when pressures to simplify organization and reduce manpower resulted in a decision to remove all responsibility for item management from system management divisions and place it in separate item management divisions. Several system management divisions at each air logistics center were also consolidated into single system management divisions, and system managers were reduced to a branch level within the divisions. The system managers' authority and power were further reduced by reallocating engineering, production, and materiel support personnel to lateral branches. Thus, the system manager was essentially a one-man branch subordinate to other branches for assistance in item management and engineering/production support. The Logistics Command's authoritative and visible single point of contact for logistical support of each weapon system was abolished.[4]

The result of these changes was a commodity management structure "inherently stronger and more cohesive" than the system management organization.[5] This paradox only exacerbated the gap in perspective between the AFLC and the operating commands. For example, monthly mission capability briefings to the AFLC commander in 1978 were couched in terms of not mission capable supply (NMCS) rates, pacing problem items, and cause codes/termination codes for unfilled requisitions. Almost all criteria were item-centered and unencumbered by the fundamental interrelationships between items and weapon systems.

The Beginning of Metamorphosis

Fortunately, the Logistics Command realized that it could not respond to the twin challenges of sustainability and responsiveness with this limited commodity-oriented mindset. Under the direction of the past two AFLC commanders, General Bryce Poe II and General James Mullins, the primary thrust of the command's mission and measurement of that mission has begun to focus on the effectiveness of AFLC support to the operational forces. The primary feature of this new perspective has been a shift to assessments employing many of the same effectiveness measures used in the operational commands.

General Poe provided the philosophical foundation for this transformation during his tenure. Prior to his selection as Commander, AFLC, General Poe had served as Commander, AF Acquisition Logistics Division, (now AF Acquisition Logistics Center), and was chosen "as much for his operational background as his logistical expertise." Throughout his tenure with the Acquisition Logistics Division, he championed himself as the "ombudsman of the flight-line mechanic." And he carried that perception of the symbiotic relationship between logistics and operations to his position as AFLC commander where he often defined the bottom line of the command's mission in terms of "supporting the combat wings" and ensuring "bombs are on-target." Even his perception of money was articulated in terms of combat capability. General Poe once defined a $40,000 savings, not as money saved, but as a "canopy, multiple bomb rack, IFF [identification, friend or foe], UHF [ultra high frequency] radio, main-landing gear tires, and 7 basic loads of 20mm for an F-16." He added significantly, "it was all in your perspective."[6]

The evolution toward closer integration with the operating units was not merely couched in rhetoric. Three initiatives demonstrated the transfer of philosophy to policy. First, the Logistics Command became seriously involved in the program objective memorandum process for the first time in championing logistics plans and programs in support of operational units. The command had previously not been a player in the Air Force's budgeting process and exercised no influence on means of supporting combat forces.[7] Second, the command concentrated on testing its wartime readiness and developing better methods for highlighting logistics shortfalls by advocating more "logistics realism" in exercises for the Joint Chiefs of Staff. Beginning with COPE LOG in 1980, the command steadily enhanced the logistics portions of these exercises with valuable dividends in lessons learned.[8] A third improvement was the expanded capability of the command's Combat Logistics Support Squadrons. Tasked to repair crash and battle-damaged aircraft and to augment maintenance and supply forces overseas, the command gave increased status to these squadrons when it understood that repair efforts translated directly into additional combat sorties.

"General Mullins charged logisticians to eliminate outdated mindsets about past methods. . . ."

Changes in the command have accelerated dramatically since General Mullins assumed control in June 1981. General Mullins' description of the Logistics Command as an operational rather than support command reflected unequivocal recognition of the unity of the logistics community and operational units. Both share an equal responsibility in the business of combat capability. General Mullins charged logisticians to eliminate outdated mindsets about past methods of doing business and to make every action by the command contribute in some identifiable way to the enhancement of Air Force combat capability.[9]

The ramifications of his challenge will reverberate throughout the Logistics Command for years but, even at this early date, two examples of the new look are evident. The first is the rejuvenation of the system manager as the principal spokesperson for logistical support of Air Force weapon systems, and the second is in a program, Meaningful Measures of Merit. Both examples demonstrate progress achieved by the command since its insular commodity-oriented days.

The former system manager now performs under a new title as weapon system program director and enjoys command-wide emphasis on weapon system management. General Mullins set the tone for this revival when he informed commanders of air logistics centers, key staff members, and weapon system program directors that the Logistics Command would no longer measure its performance in terms of "efficiency" based on traditional item-oriented indicators. It would instead

evaluate performance in terms of weapon system "effectiveness" within the ultimate mission of bombs-on-target.[10]

This renewed interest sparked some organizational changes. At the Sacramento Air Logistics Center, for example, the weapon system program directors for the A-10 and F-111 had languished as understaffed branch chiefs. Not only did this status severely reduce their visibility to operational units but, even within the logistics community, they were only as effective as their own personal leadership. But, with the new emphasis on weapon system management, both program directors were recently made division chiefs under the director of materiel management, and separate branches in their divisions once again provide dedicated weapon system engineering, production, and support. Although this reorganization is not a panacea, it has brought major improvements in both the quality and timeliness of the weapon system program director's interactions with clients by eliminating part of the hierarchical structure that previously diffused efforts and retarded responses.

A more far-reaching change is General Mullins' new Meaningful Measures of Merit Program designed to develop management indicators that measure the real effectiveness of AFLC contributions to the combat capability of the Armed Forces. The need for such a program stems from the former tendency of the command to define performance in terms of parochial goals that contributed little to combat readiness. Meaningful measures of merit require every activity in the Logistics Command to examine products that contribute to the mission of operational commands, analyze the preparation of those products, and highlight the criteria that ensure the best preparation of the products. These criteria then become the meaningful measures.

This program amends a traditional shortcoming in AFLC corporate planning—lack of close and constant dialogue with the operational commands. Prior to the metamorphosis, communications generally flowed in only one direction: customer to supplier concerning an unfulfilled need (e.g., part, technical fix, and overdue aircraft). Current two-way communications ensure that AFLC planners are cognizant of changing requirements in different operational scenarios and the needs of units to receive timely supplies for rapid responses to all contingencies. A positive step in this regard is the current frenetic drive among logisticians to become intimately familiar with war plans and possible crisis situations involving the units they support. For example, weapon system program directors have been told to learn the sortie generation rates, attrition rates, beddown locations, etc., of their units. Familiarity with the various wartime taskings allows pertinent system management organizations to examine logistics support for surge situations, determine any shortfalls, and work with appropriate agencies to correct any deficiencies.

Another corollary of this improved interaction is that the command's new measurement criteria will closely parallel the user's criteria. As mentioned earlier, the commodity-oriented lexicon of the Logistics Command often appeared as hieroglyphics to its customers. That problem should vanish as the command turns its attention from such traditional measures of merit as back orders, fill rates, and cause codes to C-status reports, war mobilization plans, and munitions/petroleum, oil and lubricants (POL) reports. Understanding prospers in the face of open communication.

Although the final model for weapon system program directors has not yet been approved, basic outlines have been developed. Three measures of merit for aircraft will orient the effort: readiness, reliability, and sustainability.[11] Readiness will be analyzed in terms of the aircraft available for a unit to perform its wartime tasking. This measure involves totaling both the mission-capable aircraft at the operational units and aircraft in depot status and balancing the number against the number necessary to meet the requirement for wartime tasking. Aircraft reliability captures the probability that the weapon system can perform its mission successfully. This measurement places the Logistics Command squarely in line with MAJCOM operational indices. For example, the probability of success for aircraft belonging to the Strategic Air Command (SAC) would be directly tied to damage expectancy in terms of probabilities for launch and flight, penetration to target, and getting ordnance on target. SAC monitors the same parameters. And sustainability will be measured as capability for sortie generation and will involve such traditional indicators as peacetime operating stock (POS), war readiness spares kits/base-level self-sufficiency spares (WRSK/BLSS), other war reserve materiel (OWRM), engines, and support equipment. Each weapon system program director will be responsible for evaluating his weapon system against these criteria and then directing the Air Force's efforts toward correcting any shortfalls.

This reorientation will not come to fruition overnight. Not only will there be behavioral problems in attempts to eliminate mindsets among AFLC personnel, but the command must also overcome major problems with data systems. Modifications in existing systems and development of new systems are necessary to provide data for making meaningful evaluations of weapon systems.

But a metamorphosis is clearly underway. Current efforts within the command strengthen its ability to allocate scarce resources for the conduct of war. This represents a fundamental turnaround in a command where traditionally the only battlefields contemplated were huge industrial hangars and warehouses. Operational units can take genuine encouragement from the new determination in the Logistics Command and from its renewed determination to strengthen the Air Force's combat capability, a cornerstone of America's security.

Notes

[1]General James P. Mullins, "AFLC Keeps USAF Ready to Fight," interview published in *Air Force Magazine*, August 1982, p. 28.

[2]General Bryce Poe II, speech to Air Force Association Airpower Symposium, Chicago, Illinois, 1 March 1980. General Poe was Commander, Air Force Logistics Command. Also, "U.S. Would Expand Combat Stockpile," *New York Times*, 22 August 1982, p. 17.

[3]For an expanded discussion of this idea, see Lieutenant Colonel Marvin L. Davis, "The Challenge for Logisticians - The Future," *Air Force Journal of Logistics*, Summer 1982, pp. 3-6.

[4]"An AFLC Organizational Strategy for Weapons System Program Management," a position paper presented to the Commander, AFLC, 9 August 1977, p. 4, and letter from AFLC Chief of Staff to AFLC Commander, subject: System/Item Management Organizational Study, undated (*circa* June 1974).

[5]AFLC Organizational Strategy for Weapons System Program Management position paper, p. 6.

[6]General William V. McBride, remarks at the official opening of the Air Force Acquisition Logistics Division, 16 September 1976. General McBride was Vice Chief of Staff, USAF. Air Force Logistics Command History, Fiscal Year 1980, p. V. General Bryce Poe II, speech to Dayton Chapter of Society of Logistics Engineers, Wright-Patterson AFB, Ohio, 6 April 1978. General Poe was Commander, Air Force Logistics Command.

[7]General Bryce Poe II, retirement interview in *Skywriter* published at Wright-Patterson Air Force Base, Ohio, Vol. 22, No. 28, 24 July 1981, p. 20.

[8]Air Force Logistics Command History, Fiscal Year 1980, p. 278.

[9]General James P. Mullins, "'Meaningful Measures of Merit' on Logistics Command Horizon," Sacramento Air Logistics Center *Spacemaker*, 26 February 1982, pp. 8-9.

[10]Colonel Wylie Sherman, F/FB/EF-111 Weapon System Program Director, debrief after special meeting called by AFLC commander, 8 December 1981.

[11]Letter from AFLC/XR to AFLC/LO, subject: Weapon System Model Working Conference Report, undated (*circa* October 1982).

CURRENT RESEARCH

Air Force Business Research Management Center (AFBRMC)

The AFBRMC, located at Wright-Patterson AFB, was activated in July 1973 as the Air Force focal point for the research of the system acquisition process and the development of new knowledge. Research is conducted within the USAF by students in graduate or doctoral programs and PME students, or by civilian activities such as colleges, universities, or commercial research firms, through Air Force contracts. Once the study is complete, the AFBRMC distributes the results and makes recommendations for implementation.

On-going Research Managed by the AFBRMC

Measuring Aircraft Availability Forecast Accuracy
Objective: Develop, document, and demonstrate a methodology, using existing Air Force data systems to track and compare the actual, observable aircraft availability to the theoretical aircraft availability forecast from existing spares inventories.

Investment Justification of Robotic Technology in Aerospace Manufacturing
Objective: Develop a methodology to measure and evaluate technical, economic, and human factor considerations in justifying capital investment of robotic technology in aerospace manufacturing.

In-Plant Technical Support of Software Contract Administration
Objective: Evaluate the buying activity and contract administration functions and recommend changes to each to ensure in-plant technical support for software contract administration.

Improving Requirements Computations for Consumable Spares
Objective: Develop additional weighting criteria within the Air Force Economic Order Quantity (EOQ) Buy Computation System and criteria for a minimum EOQ stockage policy.
(Project Officer, 1st Lt Peck)

Issues Related to the Affordability of Air Force Acquisition Programs
Objective: Identify critical issues which an Air Force planner or program manager must address in deciding whether or not the Air Force can afford to embark on a program of acquiring a new weapon or C^3I system.

A New Approach to Pricing Major Weapon Systems
Objective: Develop a new approach to pricing major weapon systems that will successfully motivate defense contractors to improve productivity and effect a net reduction in total cost.

Estimating Multiyear Savings
Objective: Develop a reliable methodology to estimate the projected savings for a program using multiyear buys versus single year buys.

Cost Estimating Relationships for Advanced Composite Materials
Objective: Develop a set of cost estimating relationships that will enable analysts to better estimate the cost of aircraft structures made with advanced composite materials.

Testing the Utility of Linear Digital Filters for Analyzing Economic System Performance Data
Objective: Test the utility of linear digital filters to analyze F-16 TECH MOD performance data.

Impact of Very High Speed Integrated Circuit (VHSIC) Technology on Air Force Logistics
Objective: Develop a Logistics Support Plan and cite several examples of how insertion of VHSIC technology will affect Air Force Logistics Command (AFLC) operations.

Balancing Materiel Readiness Risks on Concurrent Programs
Objective: Develop specific procedures for managing materiel readiness risks in concurrent Air Force programs.

Risk Assessment Methodologies for Weapon System Development
Objective: Develop guidelines for assisting Air Force weapon system acquisition program managers in making comprehensive and well-balanced risk assessments.
(Project Officer, Capt Tankersley)

Use of Development/Support Software as Government-Furnished Equipment (GFE)
Objective: Determine what an integrated, automated software development/support environment should include, and identify available tools plus those that need to be developed. Assess benefit of government developing and providing a standard environment as GFE.

Acquisition Cost Reduction Through Improved Production/Inventory Control
Objective: Establish performance measures for contractor production/inventory management systems. Develop review procedures for DOD Contract Administrative Services (CAS) organizations to use in evaluating contractor production/inventory control systems.

Development of Standard Tools for Measuring TECH MOD Savings
Objective: Develop adequate standard tools to verify cost savings to the government from TECH/MOD/IM:i^2 programs.
(Project Officer, Lt Col Robinson)

Determining the Cost of Acquisition Data Packages
Objective: Develop a valid methodology for determining the reasonableness of the contractor's acquisition data cost proposals.
(Project Officer, Maj Weber)

Air Force Logistics Command (AFLC) Logistics Management Sciences Study Program

The AFLC Directorate of Management Sciences (AFLC/XRS) is responsible for developing, managing, and executing the Command's management sciences study program. The principal goal of the directorate is to support command initiatives through application of operations research methods in both organic and contract studies. During the past year, it has developed a study plan that will enhance the capability to relate logistics resource decisions to force readiness.

The senior staff consists of:

Mr Victor J. Presutti, Jr., Director (XRS), AUTOVON: 787-3201
Mr Curtis E. Neumann, Assessment Application Division (XRSA), AUTOVON: 787-6531
Mr John M. Hill, Concept Development Division (XRSC), AUTOVON: 787-6920
Mr John L. Madden, Consultant Services Division (XRSM), AUTOVON: 787-7408
Miss Mary E. Oaks, Study Program Administrator (XRS), AUTOVON: 787-4535

The following studies are representative of the work being done in XRS.

a. *Program Objective Memorandum (POM) Enhancement.* The purpose of this project is twofold: To see if XRS can develop/improve POM forecasting techniques and to enhance its ability to relate POM requirements to operational effectiveness.

b. *Oversite of Resources and Capability for Logistics Effectiveness (ORACLE).* The purpose of this project is to evaluate and test the Rand ORACLE model to be used by management as a Budget, POM Forecasting tool (BP 1500 Recoverable Items).

c. *The Uncertainty Study.* This project will involve working with the Rand Corporation and is sponsored by USAF/LE and AFLC/XR. The objective is to determine how best to counter the major environmental and demand rate uncertainties that surround logistics operations and resource allocation decisions. The study will involve several tasks which include defining the extent of critical uncertainties affecting logistics support, assessing the implications of uncertainties for spare costs, identifying and evaluating options for dealing with uncertainties, and examining potential payoffs of enhanced lateral support and a responsive depot repair system.

d. *Modeling Strategic Airlift with Dyna-METRIC.* The objective of this study is to identify the issues and develop solutions for modeling strategic airlift with the Dyna-METRIC model used in the Air Force Logistics Command (AFLC) Weapon System Management Information System/Sustainability Module (WSMIS/SAM). The study will focus on the characteristics of strategic transport aircraft and methods required to incorporate these characteristics into the input data structure of the Dyna-METRIC model so they are appropriately represented. A key issue is that the inherent design of Dyna-METRIC is for aircraft that fly in and out of the same base, whereas transport aircraft fly across bases.

e. *Requirements Data Bank Research Needs.* AFLC is building a Research Data Bank (RDB) to provide Air Force managers with accurate and timely information for making logistics policy and resources decisions. Three XRS analysts will be assigned to the RDB organization.

Distribution Approaches: A History and a Suggestion

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Abstract

This article recommends a preferred distribution approach for supplying materiel (primarily aircraft spares) to combat units during contingencies (D+60 days). The proposed approach is meant as a criterion for planning personnel to consider as they develop forecasting methodologies for determining contingency requirements. Only aircraft spares have been considered in the approach.

Background

In January 1982, the Air Force Logistics Management Center (AFLMC) published a study, *Materiel Deployments to Austere Locations,* project number 781010-1. The authors of that study, Lieutenant Colonel Stanley D. Magner and Major Thomas W. Bellizio, identified three problems associated with supplying materiel to austere locations during contingencies: lack of adequate storage facilities, difficulties in adapting peacetime supply procedures to contingency situations, and inadequate methodology for determining contingency base support requirements (3). Magner and Bellizio indicated that all three problems have common characteristics: "... each significantly affected overall logistics support and each has historically remained unresolved" (3:iii). We are, however, concerned with only the last problem.

The emphasis, therefore, of this article is to examine distribution approaches previously used to supply materiel to operational/combat units and then to recommend a preferred approach to be used in future contingencies.

Historical Perspective

Before recommending a distribution approach to be used in supplying materiel for future contingencies, one must first examine past contingencies and distribution approaches to determine particular successes, problems, and lessons learned. In 1973, the Historical Division, Joint Secretariat of the Joint Chiefs of Staff, published a comprehensive study, *Movement Control in Three Wars: World War II, Korea, and Vietnam* (2). That volume was very helpful in this study.

The US did establish strong distribution patterns in its last three major conflicts. For example, distributing materiel to our forces in World War II began with a *push* approach using an initial "automatic" resupply system (2). Korea and Southeast Asia distribution systems began in a similar manner but, in each of the three wars, the distribution approaches did change as the conflicts progressed. Automatic resupply evolved into a combination push-pull approach and finally, in Vietnam, distribution became entirely a pull system in which units requisitioned their known requirements.

World War II

> In the fall of 1943, a new system of supply and control was adopted. It was based on the assumption that overseas supply would develop in three successive phases. During the first, *all supply would be automatic*. This would continue until the *second phase* (considered the normal phase) when *procedures would become semi-automatic*. . . . In the *third phase*, which was expected to occur considerably later, *supply would be entirely by requisition* (emphasis added) (2:2).

In 1942 a *push* distribution was used to supply materiel to the European theater but, because of excesses in some units and shortages in others, the US changed to a requisitioning system. However, the requisitioning approach in turn developed problems because of the lack of a "real time" information system to transmit user needs to suppliers. Monthly status reports from commanders were programmed to serve as requisition notices, but due to "... difficulties in eliminating overlapping reports of shortages, this requisitioning system also failed to work as planned" (2:2). Therefore, our forces developed a combined push-pull distribution approach for the remainder of the war. Despite this change, inaccuracies in inventory records and inadequacies in physical inventories persisted for the war's duration (2:2). Although the allies had distribution problems, their ability to provide supplies and equipment to combat forces did surpass that of the enemy. Nevertheless, it is important for Air Force planners and logisticians to remember that the US cannot afford to be as inefficient in future contingencies as it was in World War II. Since that war, technological progress in transportation, communication, and information systems alone has greatly improved the distribution of materiel. On the other hand, the enemy threat continues to increase the overall demand on this advancing technology; hence, there will always be a need to improve the distribution approach.

Although distribution of materiel suffered from many problems during World War II, an innovation termed "block loading" within the Pacific Ocean Area (POA) deserves mentioning as a precursor for stockage planning and other important logistics programs. In the block approach, as explained by the Joint Secretariat Historical Division, "... the theater determined a standard block of supplies needed to support a certain number of men for a given time period" (2:11). The blocks included either all categories of supplies (early phase) or only a certain class of supplies (resupply). "Under this concept the theater commander could order so many standard blocks, or so many restocks of given classes to be delivered to any designated advance base" (2:11). The block approach established a standardized forecasting method and provided some success.

On the other hand, difficulties resulted from the inability to precisely define actual line item and unit requirements. The Director of the Service, Supply and Procurement Division of

the War Department alluded to this problem in comments he made about inventory management:

> Perhaps the greatest single deficiency in overseas supply systems was the lack of adequate stock control. . . . The Army Service Forces endeavored to maintain stated inventories in the theaters equal to 50 to 120 days supply. Such stock levels were almost meaningless without accurate consumptions and inventory records. There was no uniformity between theaters, or even between Technical Services within a theater, in maintaining records of supply levels or of using these records in the preparation of requisitions. The supply information transmitted to the United States often contained many important errors. . . . There were occasions when duplicate requisitions were sent to the United States for supplies that, according to Army Service Forces records had been delivered to a theater some time previously (1:169).

"The US had entered the Korean War with insufficient and ineffective logistics planning."

Korean War

The Korean War (25 June 1950 - 17 July 1953) had its own special peculiarities which affected logistics support and the distribution of supplies and equipment. The hasty nature of our response, the proximity of Japan as a major support base, the rugged Korean terrain, and the poor in-country transportation facilities were some of the key factors aiding and/or inhibiting our logistic success (2:13). The US had entered the Korean War with insufficient and ineffective logistics planning.

> The piecemeal nature of the initial U.S. action was reflected in the evolution of the logistic system. At first there was a great deal of "movement" but very little "control." Supply procedures in effect in the Far East Command (FEC) before 25 June 1950 were largely ignored. Normal requisitioning and issuing procedures were suspended; in many instances unit trucks simply backed up to the depot warehouses and were loaded with the needed equipment. There was no time to make out the prescribed papers (2:13).

Therefore, as in World War II, the push distribution approach was used initially to provide supplies to combat units in Korea. Bulk shipping was used to maximum resources available and resupply was automatic. Later, also as in World War II, overlapping unit requests, but not formal requisitions, prompted duplication and inefficient supply actions. "Inevitably, therefore, ships were used uneconomically and piled up in the harbor of Pusan, while some non-critical items were shipped ahead of more important ones" (2:14).

Organizationally, the Second Logistical Command took over the in-country central supply system as early as September 1950. The Japan Logistical Command (JLCOM), formerly the Eighth Army (Rear), was the logistics support unit for the Eighth Army and other United Nations (UN) forces. Following the initial push of supplies from support bases in Japan, resupply of materiel came from the continental US (CONUS) supply sources. Initially, the resupply to JLCOM and directly to units in Korea was by a push system. By October 1950, JLCOM requested the automatic resupply be replaced with a requisitioning system except for certain specified supply items. In transportation, airlift was used to satisfy emergencies, but proportionally moved very little materiel in the Korean War. Intertheater airlift was provided by the Military Air Transport Service while the Far East Air Force transported intratheater requirements. Sealift, controlled by the Navy's Military Sea Transport Service, moved most of the property from Japan to Korea and from the CONUS to Japan and Korea (2:15).

As the UN forces moved northward, they encountered intratheater problems transporting supplies from the port at Pusan overland because of the rough terrain and the poor inland transportation network. Combat forces received materiel from Japan faster by sea than overland from Pusan. Additionally, distribution problems resulted from the entry of the Chinese Communists in the war in 1951 and the subsequent retreat south by UN forces. Despite this fluctuating front, the supply situation stabilized early in 1951 (2:16).

Procedures agreed upon by JLCOM and the Eighth Army in Korea (EUSAK) provided a more efficient use of shipping and a better system of supply support. Essentially, the agreement established a 45-day maximum stockage level in Korea. JLCOM also forecasted requirements based on monthly EUSAK requisitions. In essence, a system was established to limit supplies to those actually needed and to improve inventory control and distribution efficiency (2:16).

". . . the ability to clear assets through ports often surpassed the ability to transport materiel overland to the combat troops."

As previously mentioned, land transportation (rail and highway) was not very effective. Although seaport congestion did occur, the ability to clear assets through ports often surpassed the ability to transport materiel overland to the combat troops.

> It was largely owing to the transportation (ground) deficiency that many depots were established at the ports. This practice in turn contributed to port congestions. Moreover, the absence of the system of intermediate depots adopted in World War II resulted in certain loss of momentum in forwarding supplies. In some instances, combat units stationed "expediters" near the depots to make certain that needed supplies moved forward (2:17).

Despite the problems with ground transportation, supplies, in adequate quantities, were provided to combat forces during the last two years of conflict. The combination push-pull distribution approach seemed to function effectively when compared to the earlier push system. In a little over a decade following the Korean conflict, the US was again involved in a major contingency operation which tested distribution again.

Vietnam War

> The push distribution concept employed in Southeast Asia generated excesses and all the associated management problems indigenous with a bloated inventory (3:14).

These words from Magner and Bellizio's study, *Materiel Deployments to Austere Locations,* characterize the early distribution approach used in Vietnam. As one reviews literature concerning the logistics support in Vietnam, it is important to remember several things. First of all, by 1965 when the big build-up began, the Air Force had been a separate service for over 15 years and would play a significant role in this conflict. It had not participated as a separate service and to such a large degree in any previous war. Secondly, computers

and automated information systems were introduced into the combat zone and interconnected the entire logistics support system. Although Air Force supply computers were not operational in Vietnam until the late 1960s, the inefficiencies and ineffectiveness of the earlier push distribution approach became much more visible when inventories were loaded into the computers and reported to logisticians and commanders at all levels throughout the world.

As the US had initially distributed materiel in World War II and Korea, the principal logistics support for the build-up of forces in Vietnam was accomplished under a large scale push distribution approach called "Project Bitterwine." Project Bitterwine push packages were shipped from sources of supply within the US to Vietnam in 15-day increments. These packages were functionally designed; e.g., all equipment and supplies needed to operate a base dining facility were in the Bitterwine food service push package. At first the packages went directly to the combat unit; however, because these units lacked adequate storage facilities, subsequent shipments were stored in supporting depots. Problems developed similar to those in World War II and Korea concerning port congestion, lack of parts visibility, and the transporting of unneeded supplies while mission essential items were lost or detained in the transportation system (5:IV-1-6, 2:27).

Deputy Commanders for Materiel at several air bases in the Southeast Asia theater reported their personal observations concerning the success and/or failure of Project Bitterwine. They noted supply support problems as well as large quantities of excess property. A working paper for the Corona Harvest conference on USAF Logistics Activities in Support of Operations in Southeast Asia, 1 January 1965 to 31 March 1968, contained the following comments about Project Bitterwine and the lessons learned:

> The procedures to "push" supplies and equipment such as Bitterwine into a combat theater caused inaccurate supply records and excesses. . . . Because of the inability to properly account for receipts, additional requisitions were processed and duplicate shipments later received (5:IV-1-5).

In 1970, the Congressional Committee of Government Operations published a report, *Military Supply Systems: Lessons Learned from the Vietnam Experience*. They reported on the results of the push distribution system and the problems which developed:

> As the shipping backlog grew, materiel was moved directly from ship to port areas to any available storage area and stacked at random. Documentation was lost or became illegible; location systems were ineffective; needed supplies were inaccessible, packaging became weathered and damaged and markings became illegible. Consequently because needed items could not be identified or located, they were re-requisitioned, further increasing the unending flow and compounding the problems (4:6).

In 1980, Lieutenant Colonel John T. Quirk analyzed Air Force logistics shortfalls of the Vietnam build-up of 1965-68 as indicators of shortfalls in future conflicts (6). His detailed study examined 596 historical events during the early years of Vietnam and described these events in terms of the interaction between logistics "processes," "functions," and "resource elements." Examples of these 596 historical events are Event Number 222: "Peacetime facilities could not support an increased flow of airlift aircraft," and Event Number 259: "The present logistic system does not provide accurate identification of spare parts which are required to support weapon systems assigned to a base" (6:D27, D31). Quirk listed eight subelements under "processes," including requirements determination, resource allocation, and resource distribution. His "functions" included transportation, maintenance, supply, etc. (six functions in all). His "resources" element contained eight subelements, including equipment, mission related supplies, command support, personnel, and facilities. In the two Event examples already discussed, he related process, function, and resource elements as follows (6:D27, D31):

EVENT	*PROCESS*	*FUNCTION*	*RESOURCES*
222	Resource Distribution	Transportation	Facilities
259	Resource Allocation	Supply	Procedural Information

Having defined all 596 events in terms of a particular process, function, and resource element, he concluded that certain processes, functions, and resources appeared frequently. His study revealed the following significant occurrences concerning the frequencies of subelements in the 596 logistics events (6:95):

MODEL ELEMENT	*SUBELEMENT*	*FREQUENCY*	*PERCENT OF TOTAL CASES*
Process	Allocate Resources	150	25.17
	Distribute Resources	145	24.33
Function	Transportation	167	28.01
	Supply	156	26.17
	Maintenance	124	20.81
Resource	Equipment	104	17.45
	Personnel	96	16.11
	Supplies-Mission	88	14.77
	Procedure Information	88	14.77

Quirk also concludes:

> While this summary does not identify the interactions between the elements of process, function, and resource, there are useful inferences that can be drawn by the logistics strategic planner. Given that a buildup of Air Force logistics similar to Vietnam of 1965-68 is being planned, the planner would be well-advised to concentrate his efforts in the process areas of *resource allocation* and *distribution;* in the functions of *transportation, supply,* and maintenance, and in the resource areas of equipment, personnel, *supplies-mission,* and procedural information (emphasis added) (6:95).

Although most of the materiel was transported to Southeast Asia via sealift, airlift provided increasingly more priority, time-sensitive requirements to the combat forces. Early in the Vietnam conflict, sealift was processed through the Military Traffic Management and Terminal Service (MTMTS) which coordinated shipments through the Military Sea Transportation Service (MSTS). MTMTS coordinated airlift requests through aerial ports which, in turn, coordinated lift with the Military Airlift Command (MAC) (2:20). Technologically advanced transportation and communication systems provided the best distribution resources the US had ever enjoyed. Nevertheless, the US continued to experience some problems as evidenced in the following comments:

The lack of centralized traffic management in South Vietnam during the early stages of the war contributed to waste of transportation resources and created much confusion . . . port congestion, resulting partly from inadequate control procedures, but also from insufficient facilities. In 1965, there existed only two deep water ports in South Vietnam—Saigon and Cam Ranh Bay. . . . At the close of 1965, a backlog of approximately 164,200 measurement tons awaited discharge at the two ports (2:21).

However, new port construction and improved control procedures had virtually eliminated port congestion by 1967. Problems had also developed with intratheater transportation, but streamlining control of intratheater sealift and airlift under the West Pac Transportation Offices (WTO), at various locations within the Pacific theater, gradually improved in-theater movement of materiel (2:23).

In May 1965, CINCPAC expanded the mission of the Westpac Transportation Office to include cognizance over intratheater sealift as well as airlift . . . a WTO branch was opened in Yokohama. . . . In November 1965, CINCPAC established another WTO branch office in Saigon to coordinate sealift and airlift problems with the MACV Traffic Management Agency. In March 1967 a WTO Movement Control Element was established in Thailand situated with the PACAF Airlift Control Center. Thus, the mission of the WTO evolved from managing airlift to control of all theater airlift and sealift resources and determination of movement priorities (2:23).

In addition to consolidating movement control, a "common supply system" was established in Vietnam to provide materiel common to all branches of the military under the direction of one of the services. "Supplies covered by the system included Class I (subsistence), Class II E (general supplies), Class II F (clothing) and comprised approximately 3,500 items" (2:26). Therefore, the Army, Navy, and Air Force supported each other with this common supply system, thereby eliminating some duplication which would have increased the distribution problems. Of course, because of different missions and weapon systems, much of the materiel (aircraft spares) remained "service peculiar" (2:26) and could not be managed under the common supply system. Another system which enabled the services to expedite materiel to combat forces in Southeast Asia was the expedited supply procedures. Each service branch had its own system. "The Air Force system which enabled operating bases to requisition certain designated items, e.g., aircraft, vehicles, and generators from a single CONUS depot was called Speed Through Air Resupply (STAR)" (2:28).

"In the last years of the Vietnam Conflict, the Air Force gained better control over its logistics."

In the last years of the Vietnam conflict, the Air Force gained better control over its logistics. The push approach was changed to a pull approach in which known requirements were requisitioned. A computer system (UNIVAC 1050-II), designed to control and account for inventories and/or requisitions, further improved the effectiveness and efficiency of the supply support.

Despite early distribution problems in Vietnam and some inefficiencies which existed throughout the war, the US developed a successful distribution system to provide materiel to its forces through innovations and coordination of all service branches.

The common supply system, the Service-expedited supply practices, and improved control procedures instituted by both COMUSMACV and CINCPAC all worked to ease the confusion in Vietnam. The logistical situation improved throughout 1966 and, by 1967, the logistics posture for all classes of supply in South Vietnam was fully responsive to the requirements of the operating forces (2:28).

Our distribution successes in Vietnam, not unlike World War II, can be partially attributed to the fact that our military forces were better equipped and more powerful than were enemy forces. Although US combat forces suffered from inefficiencies, excesses, and even shortages of critical items, they had more materiel to prosecute individual battles than did the North Vietnamese. Therefore, the US could "pick and choose" where, when, and with what it fought. Under these circumstances, it is difficult to exhaust materiel to the point that one cannot win the battle. As our potential adversary increases its arsenal, the US will no longer be able to continue to fight as it chooses. All our materiel becomes vital to our effort to survive and win. Therefore, the capability of the US to distribute that materiel to the anticipated contingency location(s) becomes increasingly more important.

In summary, the historical data from our last three major conflicts clearly indicate the lack of sufficient logistics planning and the resultant "hurry up to catch up" philosophy which materialized in the early push distribution approach employed during the build-up of forces. If the massive push distribution-automatic resupply system that the US used in Project Bitterwine (Vietnam) as well as World War II and Korea is not the answer, then what approach will work?

Conclusions

A massive push distribution is no longer an acceptable option. In our last three major conflicts, distribution of materiel began with that approach. This push system was, in part, the product of insufficient logistics planning and a subsequent "hurry up to catch up" philosophy. A massive push approach produced similar problems (inefficiency and ineffectiveness) during all three contingencies. Some major symptoms of these problems were seaport congestion, lack of parts visibility, and the transporting of unneeded supplies while mission essential items were lost or detained in the transportation system. Considering the increasing capabilities of our potential adversaries, the US cannot afford the inefficiencies or ineffectiveness of a massive push system and successfully prosecute a war.

An automated information system is required. Not until the introduction of a "real time" information system, such as the supply computers in Vietnam, did distribution of materiel become effective and efficient. Although the supply computers were not operational in Vietnam until the late 1960s, the inefficiencies and ineffectiveness of the earlier push distribution approach quickly became visible when inventories/requisitions were loaded in the computers and reported to logisticians and commanders at all levels. Therefore, this author concludes that a computer system designed to control and/or account for inventories/requisitions is also required on future contingencies.

Some innovations from past wars offer important considerations to be used in developing future contingency distribution approaches. The "block loading" (2:11) approach used during World War II in the POA and the agreement between JLCOM and EUSAK (Korean War) to establish maximum 45-day stockage levels in Korea were precursors for stockage planning programs. In essence, these innovations

established systems which limited the materiel provided to US forces to actual needs and, thereby, improved inventory controls and distribution efficiency. Innovative programs from the Vietnam War included the "common supply system" and STAR (2:26). Even though much of the materiel the Air Force will require in future contingencies is "service peculiar" (2:26), the common supply system demonstrates the need to consolidate distribution of materiel to US forces, whenever possible, to reduce the overall transportation required to sustain our combat operations. STAR demonstrated that the Air Force could expedite materiel to operational forces when certain mission essential items could be requisitioned from a single source of supply.

Recommendations

This study recommends a combined push-pull distribution approach for supplying mission essential materiel, primarily aircraft spares, to operational forces during future contingencies. For aircraft spares, however, the push portion should be limited to the logistics contingency programs; e.g., war readiness spares kit (WRSK), base-level self-sufficiency spares (BLSS), combat follow-on supply system (CFOSS), and other war reserve materiel (OWRM) (pushed to theater operational units) and peacetime operating stock (POS) (pushed to theater distribution wholesale storage locations).

Emphasize Requisitioning (Pull)

I recommend the pull system, using supply computers to control inventories and requisitions, be fully operational prior to D+60 and continue for the duration of the conflict. In contingency locations where the pull system is already functioning (Europe and Northeast Asia), requisitioning should not be suspended or interrupted. Suggest these systems continue to routinely requisition so as to maintain a flow of materiel which can be transported from the CONUS to the contingency theater via sealift. In a Middle East scenario, a requisitioning (pull) approach should be implemented prior to D+60. Until the pull system is operational, the combined efforts of the United States Central Command (USCENTCOM) (formerly the Rapid Deployment Joint Task Force), prepositioning, and individual unit mobility (WRM/CFOSS) programs will sustain our forces in a Middle East contingency.

Maximize Prepositioning

Prepositioning aircraft spares is essential to a successful distribution approach. Therefore, I recommend OWRM be prepositioned in Europe and Asia in lieu of the planned CONUS storage locations. Of course, OWRM will support weapons systems already assigned to the theater as well as those weapons systems, which according to current war plans, are designated to deploy to the theater.

Basic criteria for choosing contingency theater OWRM storage locations include survivability, accessibility, and maintainability. Therefore, this study recommends OWRM be prepositioned away from the forward battle areas but close enough to rapidly sustain operations via at least two intratheater transportation modes.

In a European contingency this study recommends continental locations which will allow redistribution by land and/or air. Additionally, in Europe, this project recommends at least two OWRM storage locations. One is required in Central Europe to sustain forces in the Central and Northern European regions. A second storage location in Southern Europe could support operations for Southern Europe and the Middle East. However, any OWRM prepositioned for a Middle East contingency should be coordinated with the USCENTCOM to avoid duplication. Sealift and airlift will distribute prepositioned assets to a Middle East contingency. Similarly, these two transportation modes will redistribute prepositioned materiel in a Northeast Asia scenario.

To provide the OWRM greater survivability, the assets could be stored at several collocated operating bases. However, regardless of the storage locations, the plan must include routine peacetime maintenance of repair cycle parts to assure serviceability. This study recommends in-theater maintenance organizations rotate OWRM with POS assets. For example, Bitburg and Hahn Air Bases in Germany could perform maintenance on OWRM for the F-15 and F-16 respectively, whereas the serviceability of A-10 spares would be assured by RAF Bentwaters personnel in the United Kingdom.

In addition to prepositioning OWRM, this study recommends the European distribution system (EDS) (and a similar theater distribution system to be established in Northeast Asia) increase stockage levels at the beginning of hostilities. Therefore, POS stored at CONUS depots could be redistributed to the contingency theater via airlift to sustain units deploying from the CONUS to the theater. Not all assets can be moved to the contingency theater, as some will be needed to sustain CONUS operations and some must be reserved to support possible contingencies in other theaters.

Coordinate Transportation

This study recommends a transportation system (intertheater) which approximates the current system. By D+60 routine cargo will be transported via sealift and priority cargo will go by air. Choice of intratheater transportation will depend not only on the priority but the theater as discussed earlier in this study. However, this study recommends aircraft spares be transported by the theater distribution system (EDS), reserving the larger C-130 aircraft to transport other Air Force materiel as well as cargo for other services.

This study recommends a combined push-pull distribution approach which maximizes the use of prepositioning (push), intratheater transportation and storage, and normal resupply via a requisitioning (pull) system. This distribution approach will give the US a credible deployment capability backed up by a system of planned sustainability to support prolonged combat operations.

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The Military Leader - A Manager of Time

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Military leaders constantly face the difficult task of managing time—a nonreplaceable, nonstorable resource which cannot be saved or held in reserve for later use. The more individuals become involved in the functioning of society, the more responsibility they acquire; thus the more demands are placed on their ration of time. A major aid to leadership effectiveness might very well be the ability of individuals to plan for and control the use of time. This article will briefly define some management thoughts and activities which can lead to greater time efficiency in our logistics organizations.

Military leaders (this term denotes both uniformed and civilian professionals) are appointed to positions with the responsibility to prepare themselves and their units for movement into the problems of tomorrow. Unfortunately, many leaders seem to have little time for that preparation. The inadequate management of time causes individuals to become reactionary leaders, who wait for events to occur so they can react to them. Time management is controlled by the pressure of events and there is no time to think about tomorrow. Our continued existence is proof that organizations with this kind of leadership nevertheless still can be effective. There is little question, however, that this kind of leadership is probably inefficient because there is so little time to think, to analyze, to develop alternatives, or to choose. Efficiency demands leaders who can give advance consideration to suspected problems, so contingency plans and alternatives may be developed before they are needed.

The need for better time management is obvious. Many leaders claim there is not enough time to do what has to be done, let alone what they would like to do. The usual reaction then is to spend more hours on the job. Some claim they like to work at night, or on the weekend, because of less likelihood of interruption and greater probability of "getting something done." Why must it seem so natural to think this way rather than to challenge the management of time or the application of priority? Managers are usually successful through the efforts of other people, but how does that concept apply to those working alone at their desk night after night, weekend after weekend? It might be advantageous for leaders on such a treadmill to conduct self-evaluations.

How Time Is Controlled

A person's time is controlled by requirements imposed by other people, by himself, or both. Everything accomplished is in response to these kinds of requirements and must be understood before control is even practical or at best consciously possible. Examples of requirements by other people on the job include meetings, unscheduled visitors, incoming telephone calls, mandatory process compliance, incompetent subordinates, red tape, excessive information copies, faulty correspondence flow, or policy or decision delay by the boss. Self-imposed time hog requirements include procrastination, failure to delegate, tendency to fire-fight, insistence on excessive detail, the open door, habitual performance, "pet" project involvement, desire to help someone else, trying to personally do too much, inability or refusal to trust others, or insistence on error-free performance. Combined requirements include unclear communication, socializing, inappropriate agreement on priority or urgency, faulty understanding of requirements, a tendency for self-protection, or unstated or unclear mission, objective, or goal.

To better manage time, leaders must first analyze their use of time on the job. A number of researchers recommend that the first step in this analysis is the maintenance of a truthful time log for at least two or three weeks. The log should be maintained as the work is accomplished rather than be constructed at the end of the day from memory. Each entry should briefly describe what was done, its time consumption, and its origination. Interruptions to on-going activities should be noted as to source and duration. After two or three weeks, the leaders should summarize and then total time expenditures by classification (meeting, reading, etc.) and the percentage of the total that each represents. Then, they should analyze the data to expose those periods, and their duration, when they were victims instead of controllers of time.

"Busy-ness"

Many times military leaders function under a traditionalist approach which makes time management difficult. The military tradition tends to equate hard work with productivity, and this leads many to believe that individuals must always be busy or they cannot properly perform their job. Military leaders are resource managers and effectiveness should be judged on results rather than on obvious activity. Yet, the military organization seems to create a strong psychological urge to keep every available minute filled with activity. Efficient time management demands the leaders reduce that urge and replace it with profitable and productive activity. Leaders need not be "doing something" to get their job done and no observer should think that they are loafing if they are deep in thought, but physically inactive.

Compliance

Military leaders are also misled by the lure of "compliance." They are conditioned to accept and demand compliance with procedure and process. *Much of management activity is more concerned with form and format than with content or results.* Obviously, some structure in process and procedure is necessary for order and control. Too often, though, military leaders lapse into compliance without

considering the time inefficiencies it will cause. An action analysis may often reveal more concern with doing the job right than with doing the right job. It would be better for managers to take the time to define essential tasks and then insist they be done right.

Urgency

A major time problem is task priority. Many tasks are classified as "URGENT," "IMPORTANT," or "PRIORITY." A number of items rightfully fit these classifications, but these classifications are wrongfully applied in many instances. Far too often, urgency is a self-imposed crisis which, when examined, is unnecessary.

Writing

Paper is a major product of much management activity of the Department of Defense. A very large segment of time is spent writing or reviewing correspondence because military leaders assume all written material leaving their organization is a reflection of their ability to lead and manage. Therefore, it must be very near to perfection. How many hundreds of thousands of man-hours are spent each month retyping and redoing correspondence to eliminate a strikeover or to change a word. Also, too often individuals feel they must make changes to material prepared by others or they have not done their job. Obvious errors, omissions, or faulty logic must be corrected, of course; but is it necessary, or is it productive, to nitpick for other reasons? Leaders should make only absolutely essential changes to the written work of subordinates.

The Telephone

The telephone contributes significantly to modern life and industrial capability. It can also be a major time hog. Many people are like Pavlov's dogs, but instead of salivating when the bell rings, they automatically and unthinkingly reach for the phone. It seems they are psychologically unable to let a phone ring unanswered and then they are often forced to give the phone call unwarranted priority attention. The phone can, without permission, assume control of managers' time. Once they pick up the phone, the call normally gets their immediate attention and a response. Many people use the phone to get immediate attention even though they would not interrupt their leader's work by a visit.

The Open Door

The open door policy is often overdone at the expense of efficiency and individual initiative. Managers usually over-react to such policies and the policy becomes counterproductive. This is the case when the open door permits employees in the organization to feel free at any time to visit and/or communicate with managers without regard to propriety, rightness, or pertinency. An extension of this is the hot line, a direct line for employees to voice their complaints or messages at all times. The idea, in concept, is worthy but in application it is often unrealistic and many times misused.

Misdirected Effort

Many military leaders tend to become involved in misdirected efforts in the routine functioning of their unit. They fill large portions of available time with activity at too low a level for their positions or concern themselves with the acquisition of intelligence not needed. They attempt to run the various organizational elements under their authority and then displace competent subordinates. It is not truly necessary that the military leaders know at all times everything going on in every organizational element. Those who are proven reliable should be trusted and allowed to do their job. Those who are incompetent obviously need to be relocated into jobs more fitted to their abilities.

A young lieutenant in his first year out of the Academy was assigned a job preparing statistics for monthly command briefings. His boss did not believe a lieutenant could do that job and personally recomputed the data each month before the briefing. Within a year, the lieutenant was fed up with the lack of trust and requested reassignment. The boss took this as disloyal action and reflected that on the Officer Effectiveness Report (OER). Further, he refused to agree to a new job. The young officer, because of two such OERs, was not promoted to captain when eligible and left the Air Force with bitter memories. The fault: misdirected effort and possibly faulty evaluation by the leader.

Perfection

The time spent striving for perfection needs reevaluation. Consistently error-free performance is a will-o'-the-wisp and its pursuit is likely to be neither practical nor cost-effective. Survival and advancement seem based on error-free consistency and many people see one error as a dagger at the throat of their career. The result is indecisive tendencies, a strong wish to gather benefits from success without facing the challenge of the situation. Individuals should learn to accept error as a human frailty and a major learning device. A more productive atmosphere results from a climate which encourages people to exercise their experience, initiative, and desire to achieve the mission, objectives, and goals. A basic element of job satisfaction is a sense of achievement which comes from creative freedom. In other words, a sense of achievement evolves from overcoming obstacles and some mistakes are sure to occur.

Over-Scheduling

Much of modern life is complex and interactive. There is great need for scheduling and time-phasing just to get things done on time and correctly. Most Americans do maintain some form of schedule and their leaders likely have the most comprehensive schedules. Under the pressure of time leaders construct even more tight and definitive schedules for personal activities. The result is almost a minute-by-minute schedule in which one schedule-directed activity immediately follows another through the full day. Often the concentration is on schedule compliance rather than on task performance.

Meetings

Who can question that meetings hog time? Senior managers are estimated to spend as much as 60% of their time in meetings and conferences. Their motto might well be "Meetings are our most important product." To make meetings profitable, managers should:

(1) Be sure a meeting is the proper means to accomplish what is needed.

(2) Develop an agenda and tentative schedule which will cover all necessary matters yet give a shut-down target.

(3) Invite the participants (only those who must be involved and not all living Americans) and provide them an advance copy of the agenda and schedule so they can be prepared.

(4) Control the meeting so that participation contributes to the meeting's purpose.

(5) Summarize the discussion and agreements after the meeting terminates.

(6) Arrange for some form of feedback so they can learn of real progress toward their objectives.

A Final Word

Time management is critical. All of us need a conscious evaluation of how we use our time and how we better can use it. I hope I have whet your appetite for reform.

Electronic Spreadsheets: To Do What? What Are They?

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Buried in the avalanche of computer hardware and software is the electronic spreadsheet. Touted as a valuable tool for use at home or in the office, this spreadsheet is rapidly gaining popularity among many computer users.

The electronic spreadsheet can be described as a large rectangular chart or table consisting of rows and columns. To mathematicians, it is a matrix; to accountants and financial wizards, it is a spreadsheet which accounts for its name. Even though the spreadsheet is available under varied nomenclatures (MULTIPLAN tm, VISICALC tm, Super Calc tm, PERFECT CALC tm, etc.), the design and operation are always similar. Consisting of approximately 60 columns, 250 rows, and 15,000 cells (intersection of a row and column), the spreadsheet serves as a giant display which stores and manipulates data electronically. Programming or operating the spreadsheet has been simplified by creating a small group of easily learned commands and mathematical functions. Since level of sophistication, user learning requirements, and built-in capabilities vary from spreadsheet to spreadsheet, the operator should evaluate specific characteristics before deciding which spreadsheet best suits his purposes.

In other words, the spreadsheet allows users to put words, numbers, and formulas into a row-column format where the information in one cell can depend on one or more of the other cells. After entering the data, the work sheet will automatically calculate the values of the formulas. This feature is extremely valuable when the user has repetitive calculations or, more importantly, when he wants to answer those ever present "what if" questions. Obviously, the entire work sheet cannot be seen on a computer screen at one time, but this should not cause concern. All spreadsheets have commands that let the user quickly move the work sheet around to see any "window."

In summary, the electronic spreadsheet is a piece of computer software that can help decision makers quickly answer the questions:

What happened?
What is happening?
What will happen?
What can happen?

Let us look at a couple of simple examples to see what a spreadsheet can do. To determine, for instance, the cost of painting a house, first determine the area to be covered and then calculate the number of gallons of paint required. This number could be shown as a cost, depending on the price per gallon. By varying the price per gallon, one can observe the effect on the total cost. If there is a costing limit, the user sets the spreadsheet to determine a maximum price per gallon of paint.

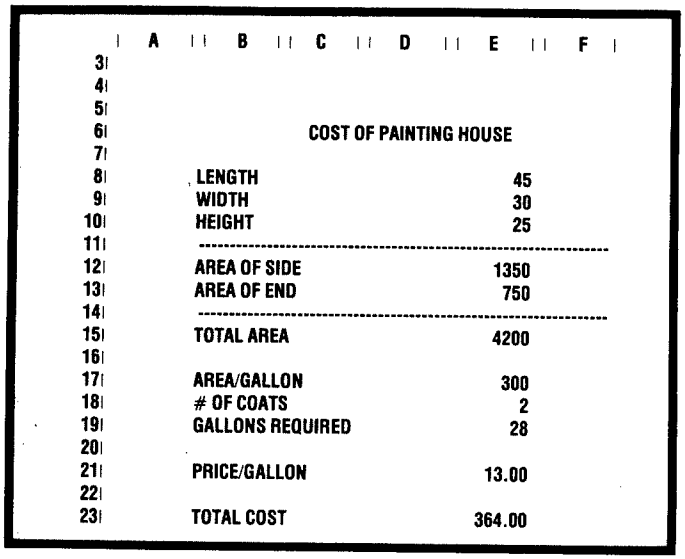
Figure 1 shows how the work sheet would look after entering labels, data, and formulas. It also shows the dimensions of the house, the total area to be painted, the gallons of paint required, and a total cost of $194.40. This example has been simplified by ignoring doors, windows, etc., but the principles are the same.

	A	B	C	D	E	F
4						
5						
6			COST OF PAINTING HOUSE			
7						
8		LENGTH			40	
9		WIDTH			20	
10		HEIGHT			20	
11		---			---	
12		AREA OF SIDE			800	
13		AREA OF END			400	
14		---			---	
15		TOTAL AREA			2400	
16						
17		AREA/GALLON			300	
18		# OF COATS			2	
19		GALLONS REQUIRED			16	
20						
21		PRICE/GALLON			12.15	
22						
23		TOTAL COST			194.40	

Figure 1.

Figure 2 shows the results of changing the price per gallon to $13.00. The only new number that had to be entered on the work sheet was the price per gallon. The spreadsheet immediately calculated the new total cost of $208.00. Figure 3 shows the results of changing the dimensions of the house to help a neighbor estimate costs. Again, the only new numbers that must be entered are the dimensions of the other house. The spreadsheet calculated the rest, arriving at a total cost of $364.00.

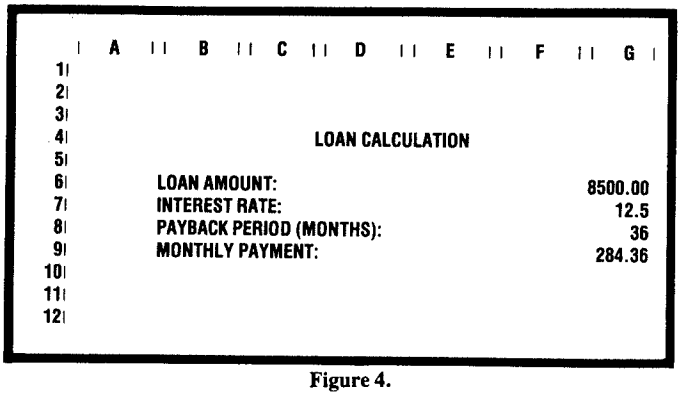
	A	B	C	D	E	F
3						
4						
5						
6			COST OF PAINTING HOUSE			
7						
8		LENGTH			40	
9		WIDTH			20	
10		HEIGHT			20	
11		---			---	
12		AREA OF SIDE			800	
13		AREA OF END			400	
14		---			---	
15		TOTAL AREA			2400	
16						
17		AREA/GALLON			300	
18		# OF COATS			2	
19		GALLONS REQUIRED			16	
20						
21		PRICE/GALLON			13.00	
22						
23		TOTAL COST			208.00	



	A	B	C	D	E	F
3						
4						
5						
6			COST OF PAINTING HOUSE			
7						
8			LENGTH		45	
9			WIDTH		30	
10			HEIGHT		25	
11			----------		----------	
12			AREA OF SIDE		1350	
13			AREA OF END		750	
14			----------		----------	
15			TOTAL AREA		4200	
16						
17			AREA/GALLON		300	
18			# OF COATS		2	
19			GALLONS REQUIRED		28	
20						
21			PRICE/GALLON		13.00	
22						
23			TOTAL COST		364.00	

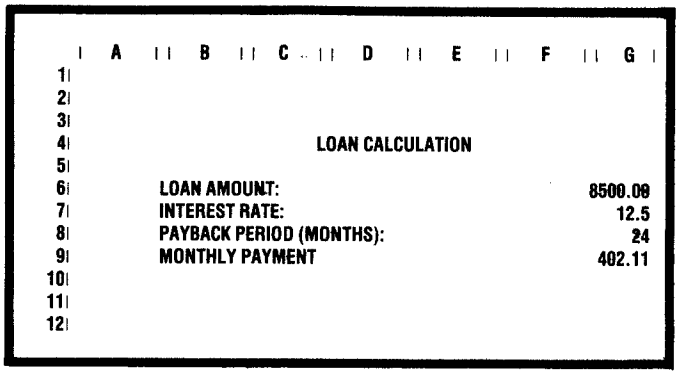
Figure 3.

In another example, let us use the monthly payment on a loan as a variable. Knowing the loan amount, interest rate, and payback period, one can quickly calculate the monthly payment. If the monthly payment is too high, the user can easily vary any of the three input variables—loan amount, interest rate, payback period—to bring the monthly payment into line. Figure 4 shows an example with a loan amount of $8,500, an interest rate of 12.5%, and a payback period of 24 months. The resulting monthly payment is $402.11. If this payment is too high, by altering any or all input variables, the monthly payment can be lowered. In Figure 5 the payback period has been extended to 36 months which reduced the monthly payment to $284.36.



	A	B	C	D	E	F	G
1							
2							
3							
4			LOAN CALCULATION				
5							
6			LOAN AMOUNT:				8500.00
7			INTEREST RATE:				12.5
8			PAYBACK PERIOD (MONTHS):				36
9			MONTHLY PAYMENT:				284.36
10							
11							
12							

Figure 4.



	A	B	C	D	E	F	G
1							
2							
3							
4			LOAN CALCULATION				
5							
6			LOAN AMOUNT:				8500.00
7			INTEREST RATE:				12.5
8			PAYBACK PERIOD (MONTHS):				24
9			MONTHLY PAYMENT				402.11
10							
11							
12							

Figure 5.

The point I want to make then is that the power of the spreadsheet is in its ability to quickly and accurately recalculate itself as data changes. Gone is the tedious drudgery of manual recalculation. The applications are almost unlimited, since many of our real-world problems can be structured in a row-column format. The spreadsheet has already gained a strong following in the areas of accounting, budgeting, and investment analysis. Its popularity is increasing rapidly in the home computer market where families are using the spreadsheet for a variety of uses, including preparation of taxes. Within the Department of Defense (DOD), the spreadsheet could prove to be a powerful tool in many logistics and administrative applications.

Specifically, the spreadsheet could be valuable in manpower planning and analysis. Many of the variables in the manpower model (attrition rate, promotion rate) could be modified to portray the effects on projected end strengths. In weapons testing, probability of a hit and reliability estimates could be altered to assess the impact on weapons suitability. In inventory analysis, it is easy to determine how sensitive a model is to holding and ordering costs. In budget projection, the user can vary inflation rates; in cost estimating, he can vary discount rates. The list of applications is indeed very long.

Yet another important area where the spreadsheet is helpful is when there are many subjectively based quantitative factors being used rather than crisp empirical data. In such a case, an analyst welcomes an easy way to quickly see the consequences of "changing the numbers," pinpointing which variables are most critical to the final answer and which variables should receive the most attention. In all these applications, the spreadsheet could assist in a determination of what is truly important in the analysis.

". . . effective procurement for national defense calls for a high order of leadership. Those who buy the nation's armament must develop sound political insight, a keen understanding of the arts of organization, and, no less than the officers who lead troops in the field, must display unusual courage."

Buying Aircraft: Matériel Procurement for the Army Air Forces by I. B. Holley, Jr., Office of the Chief of Military History, Department of the Army, Washington, DC, 1964, p. 573.

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"Our own country is a small one; the armies we can put into the field are small; unlike the Americans and Russians we can afford no wastage. But in this and every war, mere size has been shown to matter less than fighting spirit, skill and equipment. If the British armies are to be strong they must excel in these three very points; it is to the second, and to a lesser extent to the third point that Operational Research has much to contribute. May we, as a few scientists who have tried to establish in this war a new method, express the hope that, should this country ever again be faced with the disaster of war, Operational Research will contribute to that superabundance of skill and excellence of equipment which will be so vital to offset our lack of numbers."

From: "Readings on Early Military Operational Research," Royal Military College of Science, Shrivenham, Mar 84

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